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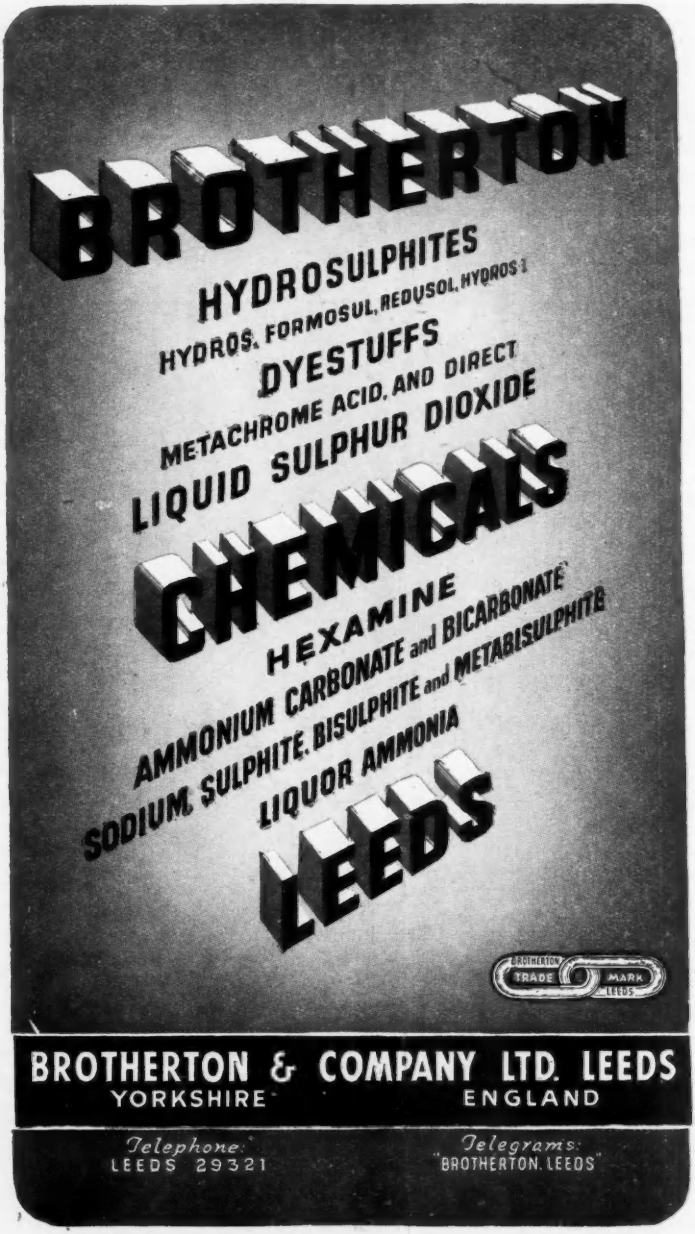
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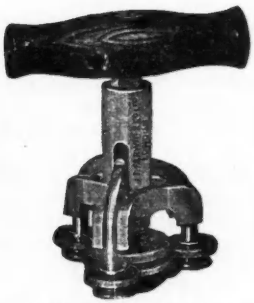

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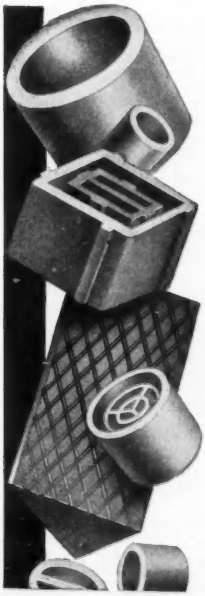

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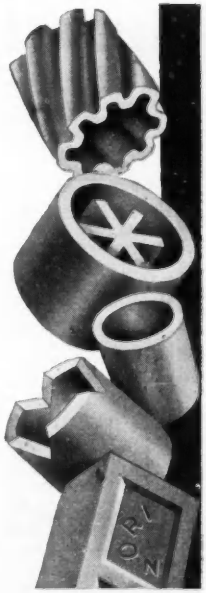

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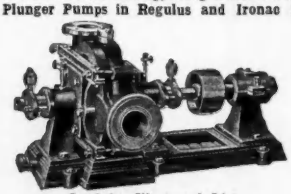

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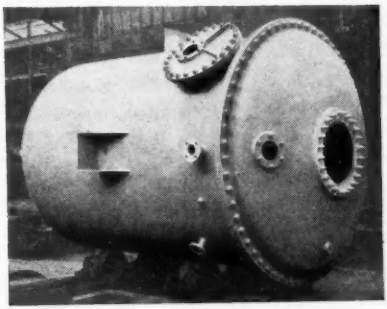

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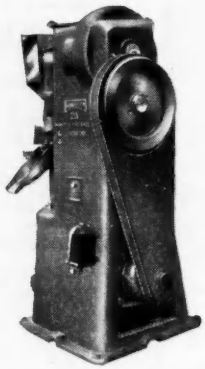

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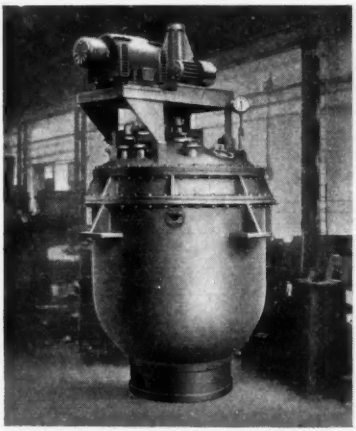

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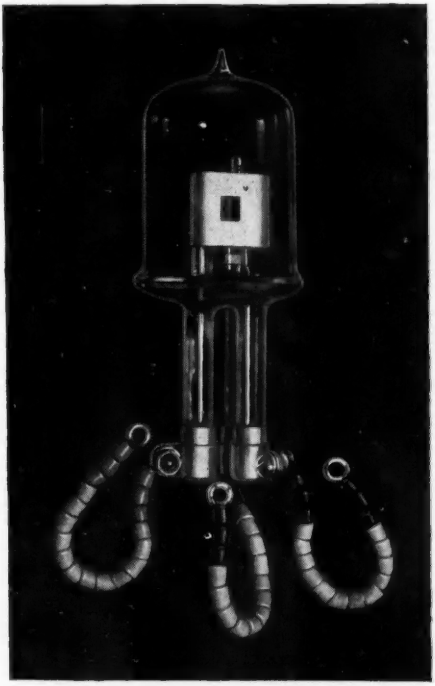

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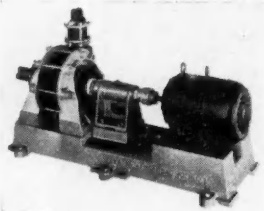

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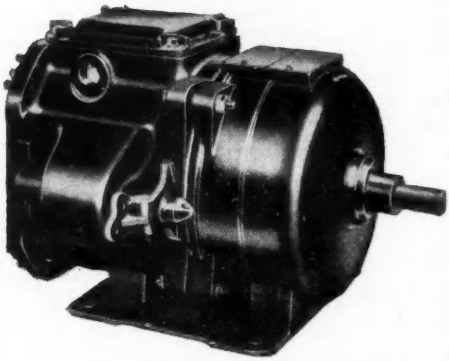

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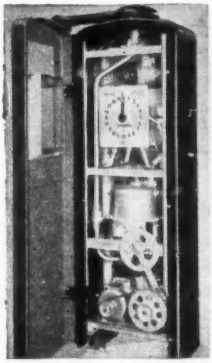

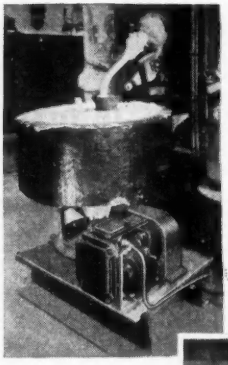

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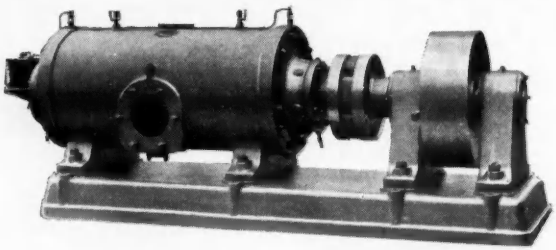

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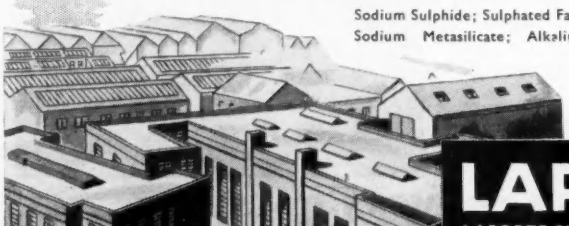

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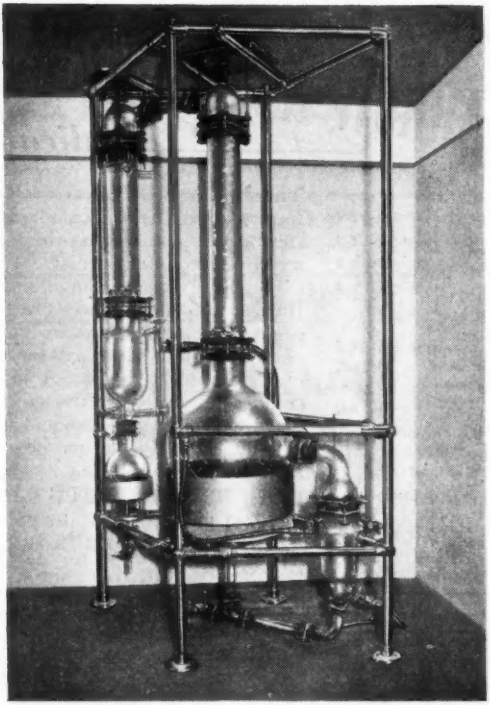

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Devaluation

SIR STAFFORD CRIPPS was less than fair when in his broadcast he said that "normally before the two wars—and at times between them—you could change our one pound sterling into other kinds of money . . . . Soon after the end of the last war we came back to this very useful arrangement." The money of 1914 was all gold, while that of 1945 was nothing better than an alloy of politics and paper. For the Chancellor to suggest any similarity between the pre-1914 free market position and that of to-day is, to put it mildly, unworthy of him.

What has happened is simply this. We have abandoned the fiction of 4.03 and put in its place another equally fictitious figure, 2.80, which leaves the money of the world in every respect as unreliable as before. The stability of the gold standard, to which Sir Stafford has surely no right to refer, relied upon the confidence of a perfectly free market in which chancellors everywhere took no part whatever. The stability to which Sir Stafford pins his faith at a fixed empirical rate is only stable so long as chancellors and politicians remain of the same mind and until on some future Sunday night another figure is announced.

Even without gold no trader was unable to know how much he could get in his own money if he sold goods abroad and how much he would have to pay in their own money for the goods he imported from other countries. Traders everywhere did, in fact—to quote Sir Stafford Cripps—"know where they were in their business." The bankers were able at any moment to cover commitments in any direction at the rates of exchange upon which those commitments were founded. The bankers' machinery is entitled to far more credit than has yet been recognised for the facilities which were so readily provided and available to all.

It may be that in confounding all the pundits, and going lower than the worst of the pessimists had prophesied, Sir Stafford has it in his mind to free the pound. Unlike commodities—sweets and clothes—the ideal to be aimed at is that the pound should be dear. If, therefore, a little later on freedom were announced, the chances of a rise from 2.80 are obviously better than from a higher figure of 4.03. The immediate risk is of unforeseen changes in unexpected quarters.

If the British Treasury thinks it wise to start the fashion in currency manipulation, a hundred other monetary authorities may see chances of their own and we may expect from

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The annual subscription to THE CHEMICAL AGE is 30s.; single copies, 9d.; post paid, 1s. SCOTTISH OFFICE: 116 Hope Street, Glasgow (Central 3970). MIDLANDS OFFICE: Daimler House, Paradise Street, Birmingham Midland 0784-5). THE CHEMICAL AGE offices are closed on Saturdays in accordance with the adoption of the five-day week by Benn Brothers, Limited

day to day to hear that Israel, Egypt, Ceylon or the Argentine has taken some step which will throw the market out of gear. Sir Stafford himself referred to this danger and confessed that the effect upon our cost of living would depend upon what other countries did.

The immediate aim is to earn more dollars. Up to Saturday last, £1 of export produced 4.03 dollars. From Monday morning the same export only produced 2.80 dollars. From which it follows that if we earn the same amount of dollars we must increase our production by one-third more than at present, and if we hope for more dollars the increase in production must be higher still.

There will be wide differences of opinion as to how far this can be done. If Sir Stafford is to be believed, and if the country is really doing its best and the workers working to the full, then it is a little difficult to see from where the very big increase in production now required is to come. The differences of opinion will depend upon the different views as to how far full employment means full work and what is the effect of enforced social service upon individual endeavour.

Manufacturers and traders should be quick to protest against Sir Stafford's suggestion that there "should not be any noticeable increase in their retail prices" and that he will "not tolerate anyone taking advantage of the situation." These remarks, coupled with the suggestion that 1½d. on the price of the loaf is all that should happen at home, cannot be reconciled with the official statement that the dollar content of the Cost of Living Index Figure is 16 per cent. There are indeed very few of our manufactures which do not contain some item of dollar cost, and if the official 16 per cent is reliable the result must be an all-round increase in price.

How much better if the Chancellor had summoned up the courage to free the pound, and announced the end of control of our money. Such a step could have been taken without regard to any of the other numerous controls existing. It would have involved a period of confusion at the start, but not nearly so much confusion as we may expect in the next few weeks and months. The result of allowing the pound to find its own value through

(continued on page 414)

Notes and Comments

University Libraries

A PLEA that the university librarian should have expert assistance in book selection, as his library was becoming increasingly important and was a specialist one in the many subjects taught and studied, was made by Dr. W. Bonser, Birmingham University librarian, at the Summer School of Librarianship, in Birmingham last week. He said the library of which he was custodian received regularly more than 2000 periodicals, and this number was all the time being added to as the range of subjects taught widened. Text books in science, technology, medicine and law went out of date more quickly than did those on the humanities and should, therefore, regularly be "weeded" and replaced by the latest editions. The librarian and his staff must keep in the closest contact, not only with the everyday work of the students, but especially with the teaching staff which directed the studies. The library was an integral part of the working of the university and was an important adjunct to every department.

Significance of Wilton

THERE are many more aspects of Wilton than those touched on in the speech of Lord McGowan. While there was little evidence of new principles being applied, the extent of application of known advanced practices was quite noteworthy. Thus, automatic push-button control has been carried to an extraordinary extent and scope. At the touch of a button in the P-F moulding powder house, one operator can convey wood-flour from any bunker at a chosen rate along a desired route to a particular mixer, and follow the path of the powder by means of coloured lights. In the same plant, but on the resin side, one operator controls the raw material storage tanks (fitted with continuous recycling and thermostatic devices), automatic scales, mixers and reaction vessels. All this is in a plant with an output of about 25 tons of finished moulding powder per day. Any failure of devices or increase in temperature in reaction calls into play automatic alarms and corrective measures. More effective than the most impassioned exhortations and importunings, this is without doubt the way to that higher productivity and p.m.h. which is so much to be desired. The "Link" connecting Wilton and Billingham by under-river tunnel is also symbolic. Movement by truck within the works and between works has been cut to a minimum; wherever possible, liquid is piped and solids moved by conveyor, ensuring the smoothest flow of product at the smallest consumption of manpower.

Ninety Years' Growth

LAST month the modern oil industry celebrated its 90th birthday. Drake's "folly" of drilling a hole into the earth has proved to be an enterprise which has brought incalculable wealth to the world. The truth of this is recalled by the Petroleum Information Bureau in an historical study of oil, showing how eventful has been the development of the commercial exploitation since those pioneering days. It may not be an overstatement to say that oil, upon which so much of industry and domestic wellbeing depends, to-day has surpassed coal in importance. Meanwhile, the chemical uses of oil are virtually certain to multiply, affording new products and making fresh demands. Experts consider there is enough crude oil in the earth to meet this and all the other demands for centuries to come; and even if the natural supply of crude fell short, a sufficient quantity of liquid fuels could be made. It has been calculated that, when Marshall Aid ends, in 1952,

Western Europe's average daily consumption will have increased by 50 per cent. The new factor in equating supply and demand is the entry of the United Kingdom as a future large supplier of refined oils and derivatives. Shell at Stanlow, and Anglo-American at Fawley, are making great additions to the cracking and refining plants, and last week's formal opening at Wilton of the I.C.I.'s group of new factories has an intimate bearing on the same policy. Such industries are not developed without enormous expense for plant and research. In America, the Standard Oil Company (N.J.) devotes the equivalent of £5 million annually for research, and I.C.I.'s own allocation bears comparison with that. The Standard Company has computed that the average return in the long run on every dollar spent on research is $15. This may or may not come to be known as the Petroleum Age, but the portents for the chemist are clear. "I am one of those"—wrote Sir Robert Robinson recently—"who have been convinced by the evidence that the future prosperity of the chemical industry cannot be assured unless we strive with all our might to take our full share in the manufacture of chemicals from petroleum."

DEVALUATION

(*continued from page 412*)

the higgling of the market, and to stand out as the one currency in the world backed by the considered views of willing buyers and willing sellers, might well be to put up the pound even higher than 4.03 instead of to depress it.

The world has not yet forgotten its one-time dependence upon sterling. It is afflicted with political money in which a minimum of confidence can be placed, and there is more than a possibility that traders of other countries would show a marked preference for the one recognised currency which had behind it, not the power of any state or the views of any politician, but the real value which only a free market can give.

Interchange of Knowledge

THE importance of the interchange of men and women between countries as a means of spreading not only better understanding between nations but for the dissemination of knowledge and technical information is becoming increasingly appreciated. Robert Oppenheimer, the American scientist, once remarked that "Perhaps the best way to send knowledge is to wrap it up in a person," and the truth of this maxim was freshly brought to mind last week by the arrival in this country of 15 professors and 60 post-graduate students who will spend a year here doing research work or on university courses. These visitors come under a scheme evolved by Senator Fulbright, the Rhodes Scholar, funds being provided from the sale of surplus war equipment. Particulars of various schemes of exchange and the large numbers of American bodies and voluntary organisations active in promoting them are given in a booklet "Building Roads to Peace," recently issued by the State Department in Washington. The American Chemical Society figures prominently in the list with offers of UNESCO Fellowships for study in chemistry and chemical engineering. Recipients have to give the assurance that on expiration of fellowship they will return to their own country to resume specified employment for not less than two years, and that it will contribute to their country's scientific and cultural reconstruction. The booklet is meant primarily for reading in the U.S.A., but it is worthy of attention in Great Britain for the exchange of persons should, to be of real benefit, most surely be wholly internally. There is, of course, also a scheme inaugurated by the Canadian-British Education Committee, under which the last party of a number of British students left Liverpool this week to spend next session at McGill University, Montreal. Such interchanges deserve the fullest support of both official and voluntary helpers in the nations concerned.

GERMAN PATENT OFFICE

Big Task for Munich Staff

ANGLO-AMERICAN authorities recently gave their agreement to new German patent legislation and it is expected that the new Federal Patent Office will be officially inaugurated on October 1.

The new Patent Office has been allocated premises in a wing of the German Museum, Munich, and it will function in the three Western zones as a successor to the old *Reichspatentamt* in Berlin.

Dr. Eduard Reimer, a Berlin lawyer who has specialised in patent and trade mark law, has been elected president. He will be assisted by a staff of some 750, compared with 1600 persons formerly employed in Berlin.

It is reported that some 250,000 volumes out of the original 400,000 books in the original library have been secured for the Munich office. They are said to have been saved from a salt mine where they were concealed during the war.

No less than 60,000 applications for patents and 50,000 for trade marks have been received at offices established about a year ago in Darmstad and in West-Berlin, and these will now have to be dealt with by the new patent office.

Uncertainties which have so far existed in Germany regarding patents and trade marks should now be ended. Rights formerly dealt with by the Berlin office can now be attended to in Munich, provided that application to this end is made before June 30, 1950.

All patents and trade marks registered in Berlin before January 1, 1932, lose their validity in the Western occupation zones.

Upon instructions of the Anglo-American authorities, the new patent office will not, for the time being, carry out examinations of patents because it is anticipated that new and internationally valid regulations for this purpose will soon be promulgated.

Tests will be carried out periodically by the Allied occupation authorities to ensure that prohibitions imposed in the field of research are being maintained.

Atomic Energy Talks

British, American, and Canadian scientists are to meet at Chalk River, Canada, on September 26 to discuss the working of combined arrangements for release of scientific and technical information on atomic energy.

CHROME PIGMENT EXPORTS

Exemption from Licensing

THE withdrawal of chrome pigments from the list of goods requiring export licences has been agreed by the Board of Trade. The decision was given effect by a Statutory Instrument which came into operation on Monday this week.

The result recalls that for 17 months pressure has been exerted by the British Colour Makers' Association.

Relevant extracts of interest have been given in a Press notice (No. 985) issued by the Board of Trade on September 14. In Group 13(1) the item relating to chromium compounds has been deleted and the following substituted:

"Chromium compounds and preparations thereof (other than lead chrome and zinc pigments), but not including lacquers, paints, paste paints and painters' enamels unless specified elsewhere in this group."

The BCMA observes that the order thus exempts lead chrome and zinc chrome pigments and it follows that mixtures of these pigments with Prussian Blue or with many extenders will no longer be subject to control.

It is noted, however, that blanc fixe remains subject to licensing, as do dyestuffs generally, so that chrome pigments mixed with these products will continue subject to the licensing procedure.

Exporters are reminded that, to avoid delays in Customs clearance, consignments should always be made under the descriptions specifically exempted from licensing, i.e., as "lead chrome pigments" or "zinc chrome pigments" and not under other technical names.

Suspension of Metal Sales

SALES of copper, lead zinc, tin and aluminium by the Ministry of Supply were temporarily suspended from midnight on September 17. Announcing this on September 19, the Ministry stated that orders posted on or before September 17 would be accepted at the prices ruling on that day provided normal conditions had been complied with.

Orders posted after that day would be dealt with at the new prices when trading was resumed.

Sales were announced to be resumed on Thursday, September 22, at new prices to be announced by the Ministry.

Advanced Equipment at Wilton

I.C.I.'s Bid to Eliminate Smoke and Pollution

THE heightened recognition by chemical industries of their responsibility to maintain new high standards of public amenity, in addition to making full use of present advanced technology, was well illustrated during last week's tour by invitation of I.C.I., Ltd., of its 2000-acre site of the new chemical centre near Middlesbrough.

The social value of the Wilton enterprise owes much to the fact that it will eventually give employment to 15,000 belonging to a Tees-side area which, in the current uncertainty of stable trading conditions, might well have known again the bitter experience incidental to being a "depressed" area. Equally important, Wilton is planned to offer employment under conditions which appear to mark an advance on the comparatively high standards of welfare lately attained in large-scale chemical production.

An important factor to promote the same result is the widespread use of cyclone extractors and electrostatic precipitators; these also help to ensure that the locality will not suffer from the polluted atmosphere once characteristic of the "chemical towns" of the north.

Of the 250,000 tons of oil to be cracked annually, half of the products will be in terms of petrol. The actual cracking plant is American (by Kellogg), although much of the ancillaries of the plant and some of the equipment were made by I.C.I.

Production of Perspex, already started at Wilton, is expected to reach a yield of ten tons a day in sheet form.

The section of the plant making P-F (phenol-formaldehyde) moulding powder is also in production, and is expected to be very much more active in a few weeks' time. At the start, something like 20-25 tons a day of this moulding powder is being produced.

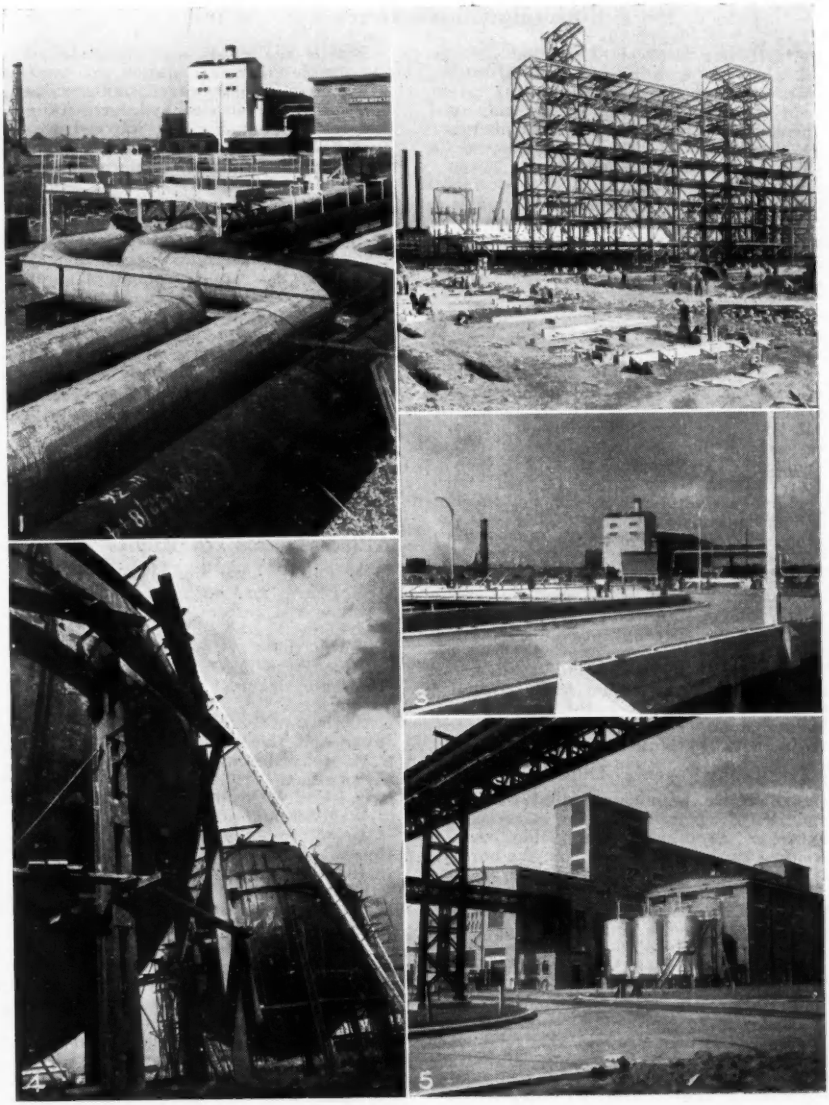
The construction of a section for the production of urea-formaldehyde is now due to commence.

At Teesport, the oil storage end of the Wilton works, begins the under-water section of the pipeline to the Billingham works. The tunnel is 100 ft. below ground level. The gas and oil transported through it are in welded pipes, and special precautions have been taken to exclude the possibility of escape of either.

Left to right: Dr. J. W. Armit, Lord McGowan, Mr. J. Rogers.

On facing page: 1. Oil-fired boilers and steam distribution pipes. 2. Oil cracking plant, steelwork and buildings. 3. Oil-fired boiler plant. 4. Hortonspheres for storing ethylene. 5. Phenolic moulding powder plant.

In the New I.C.I. Wilton Works



A Recent Formaldehyde Process

Italian Hydrogen Recovery Method

THIS new method of producing formaldehyde with recovery of hydrogen, which formed the subject of his paper read at the 21st congress of industrial chemistry in Brussels, held September 12/19, 1948, is described by Mario Maccaredda (*La Chim. et l'Ind.*, 1949, *31* (3), 7780). The method of producing the formaldehyde from methyl alcohol by oxidation and dehydrogenation may, he says, be modified in such way that the hydrogen formed may be recovered and used again directly for the synthesis of the alcohol.

Alcohol Tests

Tests of simple dehydrogenation of alcohol by passage through a copper tube heated by the Joule effect from an electric circuit, preferably in the presence of water vapour to avoid poisoning of the catalyst, have provided a method for such recovery of hydrogen mixed with a certain amount of CO. Further tests have shown, however, that by using oxygen with various catalysts such as copper, silvered copper, platinised copper or silver, the process is much more effective.

Using copper electrolytically silvered in a bath of silver acetate, yields have been increased up to about 85 per cent, with recovery of hydrogen to the extent of 0.3 to 0.4 cu. m. per kg. of methyl alcohol used, and oxygen consumption of 0.4 to 0.7 cu. m. Using platinised silver as catalyst, the conversion yield is somewhat less, but so also is the oxygen used, being about equal to the hydrogen recovered.

Hydrogen as Diluent

It has also been shown that oxidising and dehydrogenating in the presence of hydrogen as diluent give yields corresponding to those obtained from the normal air process but with additional formation of 0.13-0.16 cu. m. of hydrogen—according to conditions—of methyl alcohol converted, with a consumption of oxygen 1-3 times the volume of hydrogen recovered.

The author reviews the two main groups of processes for production of formaldehyde from methyl alcohol, including those of the U.S.A. and of Germany (I.G. Farben). His own work in this field was begun in 1938 and resumed again, after some years' interruption, in 1946. It appears to have successfully passed the pilot plant stage.

Details are given with tabulated data of simple dehydrogenation of methyl alcohol and of dehydrogenation and oxidation with and without hydrogen, using as catalyst principally the silvered copper in the form of gauze.

The tabulated results confirm the possibility of producing formaldehyde with very much the same apparatus and with the same yield as is normally obtained. Air is replaced by a mixture of oxygen and residual gas containing hydrogen, and by increasing the rate or volume of gases in circulation there is very good recovery of hydrogen.

Since the cost of the oxygen used is less than half that of the hydrogen recovered, the method offers economic advantages. Working with a large scale plant, the balance of advantage should be even greater than that indicated by laboratory tests. (*Centro Studi di Chimica Industriale del C.N.R.*, Ist. di Chim. Ind. del politec. di Milano, Jan., 1949.)

Allied Trademark Rights in Japan

THE Far Eastern Commission approved at a recent meeting a decision to provide for the restoration of Allied-owned trademark rights which were lost as a result of the war and for the protection of Allied trademark rights in Japan and elsewhere against infringement by the Japanese.

At the outbreak of hostilities between Japan and the Allied countries all trademark rights belonging to Allied nationals were seized under Japanese war-time laws. Under the policy recently adopted, the registrations of such rights are to be extended from the date of restoration for a period equivalent to the unexpired period at the time they were lost.

Before the war, the Japanese copying of foreign designs and mismarking of goods presented a serious problem. Various methods were adopted to induce foreign buyers to purchase Japanese articles.

The new policy requires the Japanese Government to prevent further registration of trademarks which are confusingly similar to well-known foreign marks, and it permits U.N. nationals to apply for cancellation of any such marks already registered.

EXTINCTION OF PETROLEUM FIRES

The Application of Air Foam and CO_2

SOME further work on the study of fires in tanks containing petroleum products, and the extinction of such fires, was discussed at a joint meeting of the Institute of Petroleum and the Institute of Fire Engineers, in London recently. The experiments reviewed were carried out by a group of workers on behalf of the Fire Research Organisation—which is run by the DSIR—combining with the Fire Officers' Committee.

"The Application of Air Foam to Oils Burning in Bulk," was the subject of the first paper presented. Part 1 of this, by Messrs. J. H. Burgoyne, L. L. Katan and J. F. Richardson, of the Department of Chemical Engineering and Applied Chemistry, Imperial College, London, discussed general effects with representative petroleum oils, and the way in which the application of air foam extinguished burning oils.

Burning Characteristics

The mechanism was found to depend on the burning characteristics of the oil and on whether the foam was applied from above the burning surface or by base injection. With an adequate rate of top application to an oil having a surface temperature during burning of not more than 100° C. (benzole, motor spirit), a blanket of foam could form at once and appeared to extinguish the fire chiefly by interrupting the transfer of heat from the flames to the oil surface, hence preventing volatilisation of the fuel.

If the surface temperature were above 100° C. it must be reduced to that figure (accompanied by foam breakdown) before a blanket could form. In some instances (heavy lubricating oil) fires were extinguished before the latter condition was achieved, but in others (gas oil) the surface temperature necessary for extinction was below 100° C. and a blanket must be formed before extinction occurred.

With oils that formed a high temperature hot zone during burning, the hot zone must be cooled to a certain temperature (about 130° in the case of Pool fuel oil) before the flames subsided. This cooling by the foam resulted in vigorous frothing, but there was no question of blanket formation. When the foam was applied to Pool fuel oil by base injection, the cooling of the hot zone was augmented by a stirring effect which mixed underlying cold oil with the hot.

If the application were slow, extinction occurred at a hot zone temperature of 130° C., but if rapid, at lower temperatures, when, however, it was supposed, the surface temperature had just reached 130° C. These effects were thought to be associated with the "temporary" and "permanent" extinguishing effects noticed with this type of oil in previous air-stirring experiments.

Pool Fuel Oil

Part II of the paper, by Messrs. Burgoyne and Richardson, discussed the comparison of top and base application to Pool fuel oil, extinction by the two methods having been studied quantitatively on a 40-gallon scale. The authors said that the numerical results were, of course, peculiar to the conditions of experiment; but their general conclusions were:—

To achieve extinction in any length of time, foam from overhead must be applied at above the minimum rate necessary to absorb the normal heat input from the flames to the hot zone. Above this rate, the time for extinction was related directly to the amount of hot zone to be cooled (i.e., time of previous burning) and inversely to the rate of foam application.

The extent to which frothing occurred was related directly to the amount of hot zone present (i.e., time of burning) and to the rate of application of foam from overhead, although the extent of frothing tended to a limiting value at high application rates for a given depth of hot zone.

Foam Rate

With base application, the minimum foam rate necessary for extinction was lessened on account of stirring, which caused cold oil to mix with the hot zone and assist in cooling it. Above the minimum rate the relationship between extinction time and foam rate appeared to be discontinuous at moderate rates, owing, it was thought, to the "temporary" and "permanent" extinguishing effects of stirring. At low rates of application there was little difference in the frothing effects due to top and base application, but at

high rates the latter caused much the more extensive frothing.

Illustrating some of their experiments, the authors showed froth coming over the side of a burning tank and the slopover of burning oil, which could reach alarming proportions even in experiments with small tanks.

The second paper, by the same three authors, on "The Use of Solid Carbon Dioxide to Extinguish the Burning of Liquids," discussed some work, the main purposes of which were to examine the effect of solid CO_2 on inflammable liquids, and to determine the best method of application in relation to the character of the liquid concerned. The experiments showed that solid CO_2 might have a certain practical value in dealing with burning liquids, its usefulness depending on the character of the liquid and on the employment of the appropriate method of application. In general, its mode of action depended on the size grading.

Surface Temperature

Powdered material, and in some cases small lumps, floated on the burning liquid and cooled the surface. In those circumstances the effectiveness of the application was, broadly, increased as the liquid surface temperature (final boiling point) and extinction temperature (which was closely related to the fire point) were greater, provided that a hot zone was not formed.

Larger grades of solid CO_2 sank in the inflammable liquid, and their evaporation caused an effect similar to that of air stirring. Liquids of high surface temperature and those which formed a hot zone were more effectively treated by this method than by the surface application of fine material, except that an edge fire (maintained primarily by the heat of the vessel walls) might be left, requiring extinction by auxiliary means.

Large Tanks

The third, and final, paper, by Mr. E. Thornton, a Fellow of the Institute of Petroleum, Licentiate of the Institution of Fire Engineers, and honorary consultant to the latter body on oil fires, dealt with "Some Practical Aspects of the Problem of Applying Foam to Large Tanks." As a memper of the appropriate committee of the DSIR during the war, he collaborated with Dr. Burgoyne's group then, and he is in charge of fire protection at the Llandarcy refineries and properties.

Acknowledging that there was now little question that during the early stages foam in adequate quantities would extinguish fires in tanks or reservoirs of oil or petrol, and that there were several types of foam commercially available for the purpose, Mr. Thornton discussed the technical difficulties of getting foam on to fires at an early stage and at an adequate rate when they occurred in very large tanks, i.e., over 80 ft. in diameter. He dealt with some solutions and tried to assess the trend of future developments.

Mr. Thornton pointed out that very large tanks required inordinate amounts of foam and complicated the problem of overhead application, requiring many fittings and much pipework along conventional lines, and large tenders if mobility of generators was sought with minimum pipework. Larger and lighter pipes and limited points of entry, he said, seemed worth consideration.

Base injection Mr. Thornton referred to as attractive on account of the lower quantity of foam required and greater certainty of entry; the possibility of eliminating all extra pipework became possible and practicable as foam-making plant could work against higher back pressures.

In a discussion of the hydraulics of getting foam through pipes of considerable length, Mr. Thornton said a solution to the problem which involved the installation of one major generator of foam at the product pump-house, with quickly made connection to the product lines when required, and which necessitated no further man-power than the pumpsman who had to start it, would be something like ideal, and demanded careful consideration; and he went on to discuss the problems involved in the pipes and generator.

Air-Foam Generators

In a reference to portable foam devices, Mr. Thornton urged that they should have means of elevating plain pourers, foam being generated at ground level and outside the bund. With the new type high-pressure air-foam generators it would seem most attractive, he said, to provide a light extension ladder to carry up a pourer head or nozzle connected by a length of 50 ft. or so of 6in. flexible hose to the generator base, the generator to be supplied with compounded water from pump or tender located outside the bund wall.

Mr. Thornton's paper contained the suggestion that the oil industry, collaborating with other interested parties, e.g., insurance companies, government research and service departments, should stage large-scale tests to put the matter on an adequate technical foundation.

TAR'S VALUE TO THE CHEMIST

History of Application and Development

THE carbonising industries, represented by nearly 1000 gas works and nearly 80 coke oven plants, are the source of two major by-products, benzol and tar.

These are of paramount importance to the chemical industry, so much, indeed, that the whole structure of the synthetic dyestuffs industry has its foundation in coal. In addition, the explosives, plastics, paints, and lacquers, pesticides, pharmaceuticals and other industries use raw materials emanating from the same source.

From benzol and tar we obtain the products generally termed coal carbonisation products or coal chemicals.

The chemical field embraced by these materials covers such diverse commodities as motor spirit, T.N.T., aspirin, nylon, dyestuffs, plastics, perfumes, fruit tree washes, and many others.

Altogether some 200 substances have been separated from tar and over 2000 tar derivatives have been obtained.

The history of the development of tar and a comprehensive survey of its many potentialities and diverse applications in industry, have been described by F. R. King, in the September issue of *Road Tar*, (*3*, 5), quarterly publication of the British Road Tar Association, from which these abstracts are taken, with permission.

Distillation

From roughly 40 million tons of coal carbonised in this country, nearly 2½ million tons of tar is produced, and today practically the whole of this crude tar is distilled.

Charles Mackintosh, who introduced the garment bearing his name, is reputed to have brought about the first authentic record of tar distillation on a commercial basis, for Mackintosh used coal tar naphtha for the rubber solution required to join his fabric. The particular naphtha is still known as solvent naphtha.

Tar distillation progressed on an appreciable scale with the discovery of the value of creosote as a timber preservative, but the real interest in tar as a source of organic chemicals was raised to a high degree by Perkins' accidental discovery of aniline mauve in 1856.

In the last weeks of the Crimean War, Perkins, then only 18 years of age, was working at Shadwell, in the East End of London, where attempting the synthesis of quinine, he failed, but one experiment yielded a reddish powder. His Professor, Hoffman, advised him to throw it away, but fortunately the advice was not taken. This was the discovery of the coal tar dye and the first coal tar dyestuffs works was opened at Greenford Green in the year 1857.

The subsequent development, and the reasons which enabled the great prize of synthetic indigo to pass to Germany is another story. It is, however, of interest to record that the necessity of finding an alternative to natural quinine in the last war led to the discovery of Paludrine utilising the field of research created by Perkin's original discovery when looking for synthetic quinine.

Primary Raw Materials

By 1872 tar was being distilled for the recovery of benzol, toluol, naphthalene and anthracene, and these four were still primary raw materials for the chemical industry. With the advance of chemical knowledge, many other compounds were identified and separated, whereas in the early days tar was burnt and dumped.

The growing interest in the by-products, commencing with the patent for a naphtha lamp in 1848, to the development of the dyestuffs industry, together with the further use of benzol in the internal combustion engine, continued to foster distillation of tar, and the recovery of by-products.

Within the chemical industry, benzol, with the addition of nitric acid, becomes nitro-benzol, and with cast iron borings discarded by the engineering workshops, is turned into aniline oil.

Dyestuffs

From this latter product developed a large number of aniline dyestuffs and this was the synthetic dyestuffs industry which had its romantic conception in Perkin's discovery in 1856, after Faraday's original discovery of benzol in 1825 had opened up what eventually became the brilliant field of organic chemistry.

Typical of the swift development of tar derivatives were the researches by Professors Wynne and Armstrong, who in the

10 years 1886-96, discovered a number of naphthalene derivatives, amounting to no less than 465 products.

Benzol is utilised at some stage or other in the majority of synthetic colours, while other uses cover synthetic phenol (carbolic acid) and the more recently introduced synthetic rubber.

Closely related to benzol is toluol, ingredient of the well-known explosive **TNT**, and also an important base for dyestuffs.

Xylol is used extensively in dyestuffs, paints, varnishes and finishes of the lacquer type and is also a source of synthetic perfume of the musk variety. Naphtha completes the light oil list and is used as a solvent, especially in the paint trade.

Pyridine

Another product obtained in this range is pyridine, from which the sulphapyridine drugs are made. It is also used as a water repellent in textiles and in rubber accelerators.

The next cut from tar distillation is that of the middle oils, the fraction distilling over between 170° and 225° C., and it is here we obtain the important carbolic oil and naphthalene oil. The former provides the tar acids from which is produced the important product phenol. This is known as natural phenol to distinguish it from the synthetic phenol produced from benzol.

In this group, we have the cresols, cresylics and xylenols. Lister, developing antiseptic surgery, first used phenol, then generally referred to as carbolic acid, in 1865 for that purpose. The product had been originally produced for the dyestuffs industry, and is, in fact, still used by it. Apart from phenol's main outlet in the plastics field, it is also the starting point for a route which eventually produces nylon. It is the source of many salicylates of which aspirin is the best known.

Cresol

Among the other tar acids, cresol in the meta rich grade is used extensively—and in fact is second only to phenol—in the plastics industry. Synthetic resin finishes and dyestuffs also consume cresols, while a more recent application in the form of orthocresol finds a big outlet in weed control.

Cresylic acids are used in considerable quantities in the home and export markets for sheep dips, insecticides, disinfectants and detergents, in addition to which quite a tonnage is used in ore flotation processes for the refining of minerals.

The second cut in the middle oils, the naphthalene oil, is of particular importance to the chemical trade. Familiar with the moth repellent naphthalene ball and as a firelighter, it is second only to benzol in the dyestuffs industry. This is a raw material for the production of beta naphthol, phthalic anhydride and a large number of dyestuffs intermediates.

Phthalic anhydride runs into an important field of plasticisers and synthetic finishes in the plastics and paints industry and in dimethylpthalate provided the delousing treatment of the last war. Naphthalene is also utilised for the dressing of hides and for horticultural specialities, together with the production of insulating waxes and alternative solvents to white spirit and turpentine.

The next fraction gives us the bulk of the creosote and anthracene oils. Creosote, the well-known timber preservative represents, outside of pitch, the main constituent of tar, and naturally enters into the economics of tar distillation to an over-riding degree.

Apart from timber preserving, a considerable proportion of the U.K. production is hydrogenated into aviation and motor spirit. During the war years, creosote found a new outlet; blended with pitch it provided the creosote-pitch fuel, which many industries utilised and, in fact, continue to do so.

Anthracene Oils

Creosote and anthracene oils also supply the fruit tree washes which account for a very important tonnage, while from anthracene are provided the important rich alizarine colours which feed the textile demands, particularly for Eastern markets.

A one time burden to the tar distillers, pitch now finds a ready outlet, mixed with coal dust or otherwise unsaleable fuel to make briquettes, a market of considerable dimensions which fell away just prior to the last war, but has now recovered. Apart from the creosote-pitch fuel already referred to, pitch is also used for electrodes and cable production, coating material for roofs and floors and in road dressings.

While this survey of the recovery and application of tar derivatives is by no means complete, it may help to emphasise the importance of by-product recovery to the chemical and allied industries.

The Chemist's Bookshelf

CHEMISTRY OF SPECIFIC, SELECTIVE AND SENSITIVE REACTIONS: F. Feigl, translations by R. E. Oesper. 1949. New York: Academic Press, Inc. London: H. K. Lewis and Co., Ltd. Pp. xiv + 740. $13.50.

The appearance of any book by Dr. Fritz Feigl must be regarded by analytical chemists with more than ordinary interest. It is not an exaggerated view to see the present work as one of the major events of the last few years for those interested in this branch of chemistry. At first sight the range of the work appears to correspond closely to that of the theoretical part of Dr. Feigl's earlier *Qualitative Analyse mit Hilfe von Tüpfelreaktionen*, later published separately in English translation as *Specific and Special Reactions*. It is, however, clear that extensive re-writing and expansion must have been involved, since it now requires 740 pages to cope with topics which in 1940 were discussed in 190 pages. The first major increase is in the chapter now entitled Types of Complex and Co-ordination Compounds which Play a Rôle as Reactants and Products of Reaction in Analytical Processes. This has grown from 27 to 44 pages, the extension being due principally to the inclusion of two sections dealing with organic molecular compounds and with complex compounds of undefined stoichiometric composition.

In the next chapter, on the Masking and Demasking of Reactions, an increase from 11 pages to 42 is due largely to the inclusion of many more examples of the former phenomenon, but there is also an appreciable section on demasking, a topic not dealt with before. The chapter on Enhancement of Reactivity is expanded by about one-half by fuller discussion and an increase in the number of examples cited.

The largest reconstruction is seen in the chapter on the Effect of Certain Organic Groupings on Specific and Selective Activity of Compounds in Inorganic Analysis—an increase from 33 pages to 202 pages. Great strides have been made in the past few years in the investigation, reflected by the increasing number of monographs and papers dealing with the subject. The topic is here dealt with in detail and with authority.

A consideration of the same problems as applied to organic analysis forms what is in effect a completely new chapter. Although this aspect of the theory of selective reactions has, as yet, received little attention, it may be presumed, reasoning from the increase in the inorganic field, that considerable developments are to be expected in the near future. This justifies the segregation of the topic in a separate chapter, rather than its inclusion in a chapter dealing primarily with topics of inorganic interest.

The chapters on solution and on weighting effects have also been increased to rather more than double their original size. The next major increase is in the chapter on Surface Effects in Analytical Chemistry, which replaces that originally entitled Capillary Phenomena in Spot Reactions. This latter subject now rightly forms only one section in the discussion of a wide variety of phenomena which fall into the confines of surface chemistry, and the increase from 17 pages to 180 is fully justified, permitting a discussion of such factors as particle size, colloidal behaviour and adsorption.

A new chapter of 58 pages deals with the influence of physical and chemical conditions on the nature of precipitates, and with the allied problem of localised reactions. Finally, the chapter on fluorescence analysis is increased from six to 24 pages, and includes an interesting discussion on photochemical phenomena in relation to spot reactions.

The book, as one has come to expect with Dr. Feigl's works, has very full author and subject indexes. On looking at the author index, it is obvious that Dr. Feigl has himself taken a very considerable part in the researches in this field. What may not be so apparent, however, is how much the theoretical development of the field owes to his work over many years. This book shows that he still may claim to be the acknowledged master in the branch of analytical chemistry which he can be said to have initiated.

HOME

Cargoes for Britain

Cargoes, financed by Marshall Aid, due to arrive in Britain at the end of last week, included: Steel 10,750 tons; aluminium 8551 tons; zinc 800 tons; and copper 755 tons.

Mineral Wool

The Dinorwic Slate Quarries, Llanberis, the largest of their kind in the world, may be producing mineral wool from slate waste before the end of the year. Output will be on a very large scale and, as the wool is non-inflammable and its melting point is very high, good industrial demand is anticipated.

K.I.D. Exemptions

The Treasury has made an Order exempting from Key Industry Duty the following amyl alcohol: pentanol - 2; and the following hexane diol: 2 - methyl - 2, 4 - pentane diol, for the period beginning September 19 and ending December 31. The Order, entitled "The Safeguarding of Industries (Exemption) (No. 6) Order, 1949," is published by H.M.S.O., price 1d.

Industrial Instruments on View

The engineering aspect of its business, is in future to be featured in the window display of its London showrooms by George Kent, Ltd. The firm, whose industrial instruments, manufactured at Luton, now represent the greater part of its output, also has a factory in Wales and branches overseas in South Africa, Australia and Penang.

Shell Chemicals in Scotland

With their Scottish Divisional office now fully established at 28, St. Enoch Street, Glasgow, Shell Chemicals, Ltd., are now dealing direct with orders for the Teepol group of wetting agents and detergents for the industrial solvents now coming from the Shell plant at Stanlow. Mr. C. Duckworth is the divisional manager, and the telephone number of the Glasgow office is Central 9561.

Coal Production

There was a fall of 8400 tons in Britain's coal production last week compared with the previous week, but output was 181,900 tons higher than in the corresponding period of last year. Comparative figures are: Last week: 4,229,100 tons (deep-mined 3,955,100 tons, opencast 274,000 tons). Previous week: 4,237,500 tons (deep-mined 3,967,200 tons, opencast 270,300 tons).

Institution of Chemical Engineers

Particulars of the Associate-Membership Examination for 1950 and application forms (returnable December 1, 1949), may now be obtained from the Hon. Registrar, Institution of Chemical Engineers, 56 Victoria Street, London, S.W.1.

New Distribution System

Laporte Chemicals, Ltd., is closing its premises at Lidget Green, Bradford, and after September 26 this branch of the business will be conducted from the works of the subsidiary, John Nicholson & Sons, Ltd., Hunslet, Leeds. Stocks will be held at Hunslet and deliveries effected in the same manner as previously from Bradford.

ECA Post-Graduate Scholarships

The Treasury announced last week that some 50 post-graduate scholarships are to be awarded for the study of technology at selected universities and technological institutions in the U.S.A. in February, the cost being met from ECA funds. The awards are open to students who hold a good honours degree in pure science or technology, and are now working in industry or research associations or teaching in universities or technical colleges.

Import Licensing Office

The Import Licensing Department of the Board of Trade (with the exception of the machinery section and the staff dealing with European Recovery Programme claims) transferred, as from Monday, September 19, from its premises in Regent Street, London, W.1, to Romney House, Tufton Street, Westminster, London, S.W.1. (Telephone: Abbey 9080). The machinery section and the staff dealing with ERP claims will remain at 91 Victoria Street, London, S.W.1. (Telephone: Abbey 7898).

Efficient Ironfoundries

To promote greater efficiency in foundries a research team is to be set up by ironfounding employers in conjunction with the British Cast Iron Research Association and the Council of Ironfoundry Associations. The team will be available to visit any foundry by invitation, and confidential reports will be made to the managements on any steps that may be needed to improve performance. An executive with experience in management and costing, an engineer for planning and mechanisation, and a metallurgist will be among the first staff to be appointed.

RESEARCH WORK IN AUSTRALIA

Wide Demands on the DRL

THE increasing and varied work of the Australian Defence Research Laboratories (formerly Munition Supply Laboratories), is described in the annual report for the year ended June 30, 1948, now made available by the Minister for Supply and Development, Senator J. I. Armstrong.

The work of the DRL, which has headquarters at Maribyrnong, Victoria, covered a wide range of investigations, and was distributed 40 per cent for the Supply and Development and Services departments, 23 per cent for other Government departments, 16 per cent for private industry, and 21 per cent on broad researches affecting all these groups.

New branches of the DRL are being developed in New South Wales and South Australia.

Some idea of the diversity of the demands made on the DRL is given in the following summary of the report (*Chemical Engineering and Mining Review*, *41*, 341).

Weathering of Paints

The paint laboratory has continued its study of the weathering of paints in various Australian climatic zones. A programme of tests has been started to investigate the formulation of roof paints to suit Australian conditions. Paint-holding properties of Australian timbers are also being investigated.

A systematic study is being made of drying oils obtained from seeds of native and cultivated flora in Australia and other south-west-Pacific areas. Oils with valuable properties have been found which promise to be useful substitutes for imported products.

Studies have been made and are continuing of the deterioration of lubricating oils in internal combustion engines and of the effect on engine and oil economy of the use of oil filters.

Investigations are being made into the degradation of cellulosic materials by fungi and into methods of proofing them against attack.

DRL has received many requests from Government and private establishments for help in assessing health hazards in industry in the shape of toxic vapours and dusts.

Investigation is in hand to develop equipment whereby unskilled workers can quickly and easily detect dangerous concentrations of toxic materials in the atmosphere of factories.

Assistance has been given to industry in overcoming a wide variety of problems met in casting, forging, cold working, welding, heat treatment, and corrosion-protection of metals and alloys and in their use in engineering, domestic and other applications.

Metals

Facilities include an experimental foundry recently set up for the investigation of problems in the casting of metals, X-ray equipment for detection of defects in castings and in welds, and a laboratory for investigational work in electroplating and electro-polishing of metals.

An investigation has been in progress into the effects of surface treatment of steel on its fatigue characteristics.

It has been found that shot peening (the bombardment of the metal surface by fine shot under controlled conditions) is of considerable value in lengthening the life of metal parts subjected to high stresses.

Much work has been done on the designing of lens systems for special purposes.

The optics laboratory has been experimenting with the techniques of interference and phase-contrast microscopy which have been recently developed overseas. These techniques greatly increase the performance of the microscope in the examination of specimens of low optical contrast.

Optics

The laboratory is developing suitable methods for constructing the necessary optical parts for these branches of microscopy.

Demand for checking and calibration of instruments on behalf of other laboratories has continued. This service includes checking of gauges and length substandards used to control precision manufacture, and the calibration of electrical instruments, thermometers and pyrometers, testing machines, balances, and weights.

It is expected that this work will increase when registration of laboratories by the National Association of Testing Authorities begins.

Growth of the Indian Plastics Industry

Production of 3000 Tons of Finished Goods Annually

THE Indian plastics industry, which was born during the recent war, to-day produces over 3000 tons of goods annually. Total investments of Rs.50 million have been made in the industry, which has 70 factories employing 10,000 workers, according to statistics recently released by the All-India Plastic Manufacturers' Association.

The consumption of plastic goods in India has risen steadily from 500 tons in 1939 to 4000 tons in 1948-49. Plastics have, apparently, come into use in every walk of life in India. The industry has, however, had to depend entirely upon foreign countries for moulding powders and other raw materials. In the financial year 1948-49, about Rs.3.5 million worth of raw materials were imported, moulding powders alone accounting for Rs.2 million.

Competition from Abroad

Besides this handicap, the industry had to face stiff competition from the U.K. and the U.S.A. The Indian market has, in fact, been virtually flooded with plastic goods from the U.S.A., the largest manufacturer in the world in this field, with the result that the All-India Plastic Manufacturers' Association sought tariff protection from the Indian Government this year.

The Government's Plastics Advisory Panel has recommended that the nation's resources of raw materials necessary for production of finished goods be fully exploited. The panel states that India is favourably placed for the raw materials for the synthetic plastics industry. There is, in addition, an abundance of naturally occurring resins and resin-forming materials.

Moulding Powders

A delegation of the All-India Plastic Manufacturers' Association, with a technical adviser of the Indian Government, toured the U.S.A. and the U.K. this year to study the latest developments and methods of manufacture. In its report to the Government, the association stressed the need for the immediate establishment of a central factory to manufacture moulding powders.

The Indian Government is now experimenting with the manufacture of urea and phenol, and two of the essential raw materials for the industry. A start has already been made in basic research by the Indian Council of Industrial and Scientific Research. The Department of Chemical Technology of the University of Bombay has also started a course on plastics manufacture.

Meanwhile, the Indian Tariff Board has submitted its recommendations on the extension of protection to the plastics industry, and the government's decision is awaited.

Chemical Raw Materials

Mr. R. Srinivasan, plastics development officer to the Government of India, has stated that the shortage of chemical raw materials in India is a big handicap to the plastics industry. Referring to the small advance made in the moulding branch of the industry, Mr. Srinivasan suggests that, consistent with the availability of foreign exchange, it would be desirable to allow the natural expansion of this branch of the industry by permitting imports of equipment and raw materials. Moulds could be made more economically in India, he suggested, provided the necessary technical assistance for their design and production was obtainable from foreign countries.

Mr. Srinivasan revealed in a recent report to the Government, that some of the firms specialising in mould making in the U.K. and in the U.S.A. had indicated their willingness to participate in a joint venture with Indian firms for the establishment of a mould-making plant in India.

Australian Iron and Steel Plan

THE possibility of the establishment by American steel interests of new departments of the iron and steel industry in Western Australia is being given close examination by an American company, according to the Australian News and Information Bureau, New York. At present, an American steel mill expert, Mr. H. C. Lenhart, vice-president of H. A. Brassert and Company, consulting iron and steel engineers of New York, is in Perth to investigate prospects. A steel authority has reported in Sydney that H. A. Brassert & Co., has a lease of half of Koolan Island, in Yampi Sound, Western Australia. The lease contains an estimated 90 million tons of iron ore.

OVERSEAS

Hungarian Scientific Glassware

A new type of heat and alkali resistant glass having chemical uses is being manufactured in Hungary by the Nagykanizsa Glass Works under the name Pirover.

South Africa's Petrol Rationed

The low state of petrol reserves in South Africa, as was expected, has led to the introduction of rationing. The form of restriction to be applied will probably be announced shortly.

Uranium Buying Pool

The Australian Government has set up a buying pool to encourage the mining of uranium, Senator Armstrong, Minister for Supply, stated in a recent broadcast. The pool is based on purchasing schemes which had been announced by Britain, the U.S.A. and Canada.

Guarantee to German Scientist

Professor Stieve, the anatomist of the Humboldt University in the Russian sector of Berlin, has been given a guarantee in writing by the Soviet Department of Education that in future he will be given full freedom to publish the results of his researches. The professor had notified the authorities of his intention to resign unless he was assured of freedom of scientific research.

Reopening of Haifa Oil Refinery

Technicians of Consolidated Refineries, Ltd., are said to be inspecting its plant at Haifa in preparation for resuming operations early next month. According to a *Times* correspondent, the first tanker from Cardón, Venezuela, was expected on 15 September and unloading was planned to begin three days later. Relations between the company and the Israeli Government are reported to be cordial.

Antrycide Tests

First tests with Antrycide, which, it is thought could possibly make nearly 6 million acres of Africa safe for beef cattle, have proved "fairly satisfactory," Dr. S. C. Hassan, senior veterinary officer of the cost province of Kenya, said at Mombasa on September 12. A 6-month experiment with the drug had been made at Gedi, worst spot for the tsetse fly on the East African Coast. Twenty-six beasts inoculated were in excellent condition. One died three weeks after having been inoculated.

Air Pollution Symposium

Research institutes and universities are collaborating to organise the largest symposium yet held in the U.S.A. on air pollution casues and prevention. This is to be convened at Pasadena on 10 and 11 November. Scientists and engineers will co-operate to provide fundamental information and ideas on methods of analysis and control.

Australian Oil Drilling

Following nine years' investigation of oil prospects in central Queensland, the Shell Oil Company is said to have selected a site for a deep test. It is situated nearly 400 miles north-west of Brisbane, and drilling is expected to begin in December. A British rig, capable of drilling to 10,000 ft., is being installed. The Shell Company representative in Canberra said that, if necessary, drilling would be continued to 10,000 ft.

American Plastics Development

A VINYL plastic motion picture screen, the first of its kind to be installed in America, is now in use at the New York Strand Theatre on Broadway. Made by the Radio corporation of America, it is expected substantially to increase the efficiency of motion picture projection. ECA engineers claim that the screen has no glare. Its composition and finish are said to be so contrived that it will not collect dust, maintaining its high efficiency far beyond the life of previously used materials. The plastic coating is fused to the screen at 400°F. Tests conducted by the Electrical Testing Laboratories, New York City, indicate that the screen is the whitest available, and has the highest reflection efficiency. The material is so flexible that the 18 by 24 ft. screen can be folded without marring the smoothness of the surface coating.

A new type of urea resin glue, said to provide a bond resistant at water boiling point at far lower cost than similar cold-setting glues, is being introduced by the Borden Company's Chemical Division, New York. Specially designed for the furniture and other woodworking industries, it sets and cures quickly, and forms a strong light-coloured bond. Known as Casco Resin 155, it is made with either of two catalysts, one for cold-press operations and the other for hot-press.

· PERSONAL ·

THE appointment of MR. H. M. GARNER to the post of chief scientist to the Ministry of Supply was announced at the beginning of this week.

Mr. Garner, who was born in 1891, has been principal director of Scientific Research (Air), in the Ministry of Supply since 1946.

In 1927 he became senior scientific officer of the Royal Aircraft Establishment, and two years later chief technical officer, Marine Aircraft Experimental Establishment, Felixtowe. He was appointed deputy director of Scientific Research, Ministry of Aircraft Production, in 1943.

Mr. Garner, who is the author of numerous scientific papers on aerodynamics, succeeds Sir Ben Lockspeiser, who was appointed secretary of the DSIR when Sir Edward Appleton took up his post as principal of Edinburgh University (THE CHEMICAL AGE, *60*, 305).

PROFESSOR R. A. MORTON, Professor of Biochemistry, in the University of Liverpool, left Newcastle-on-Tyne last week for a visit to Norway and Sweden. The professor will lecture to the Norwegian Physiological Association, and also to the Anglo-Norse Society and the Polytechnic Society for the British Council. In Sweden he will give addresses in Stockholm and Uppsala by arrangement with the University of Stockholm. The subjects of his talks will incude: "A Provincial British University in the Post-war Period," and Vitamin A."

MR. D. B. COLLETT, Dunlop's general works manager at Speke Liverpool has been appointed vice-president and general manager of the Dunlop Tire and Rubber Goods Co., Ltd., Toronto, of which MR. J. I. SIMPSON will continue as president. Mr. Collett, seventh son of the late Sir Charles Collett, joined Dunlop in 1936. He became chief labour officer at Fort Dunlop and was then appointed to the Speke factory. He will be succeeded at Speke by MR. E. E. QUINTON, who has been works director of Dunlop South Africa, Ltd., in Durban since 1942.

MR. J. P. BRIERLEY, technical director of Lever Brothers (Port Sunlight), Ltd., has been appointed technical director of the firm's South African group, including companies in Rhodesia and Nyasaland. Mr. Brierley, who is a native of Port Sunlight, began his career with the company in 1920. He served in South Africa and Canada, returning to take up his post as technical director in 1947.

OCCA LECTURES

HOW ideas develop in a given field of investigation and how experimental techniques are evolved to follow those ideas will be the subject of a series of three post-graduate lectures to be given by Prof. M. G. Evans.

The series is sponsored by the Oil and Colour Chemists' Association and will be given on Thursday evenings at the Royal Institution, Albemarle Street, London, W.1, beginning on October 6, at 6.30 p.m.

The first lecture will deal with the knowledge of the kinetics of, and the factors influencing, simple gas phase reactions involving atoms or radicals.

Lecture 2 will cover the special techniques for the study of electron transfer reactions in solution, and the final lecture will discuss the experimental and theoretical aspects of oxidation-reductions, factors influencing such reactions, and the mechanism of ærobic oxidation of ions.

Electronics for Spectroscopists

A SUMMER school planned to meet the needs of spectroscopists requiring electronic techniques and of electronic engineers who have to design suitable equipment was held at University College, Southampton in July.

The success of the school, which was well attended, is shown by the first reports now available. A full account will appear in the bulletin of the Photoelectric Spectrometry Group, which sponsored the scheme, and it is hoped to issue the complete notes of the course in book form.

Professor E. E. Zepler (Electronic Engineering) and Professor A. M. Taylor (Physics) with their staff, gave generous help. Mr. C. G. Cannon was organiser for the group.

Lectures and demonstrations were given by the professors and other members of the University, also by three members of the group.

Chemical and Allied Stocks and Shares

DEVALUATION of the £ was expected in the City sooner or later and did not come as a surprise, but the extent of the devaluation was larger than anticipated, and markets have been more active than for a long time past. Greatest rises were scored by gold mining shares because of the increase in the price of that metal following devaluation of the £, but there were all-round gains in industrials, shares of big exporting companies to the U.S.A. and Canada being the chief beneficiaries.

On the other hand, British Funds and other securities of the fixed interest-bearing type lost ground, although there was no marked selling. Declines in Gilt-edged have ranged up to £2, mainly because the prospects of increased cost of living is tending to keep buyers off fixed-interest stocks in favour of shares which offer scope for capital appreciation and eventual increases in dividend payments.

Devaluation has also resulted in a general rise in base metal mining and commodity shares, particularly rubbers which were higher as a result of the increases in price of the commodity. Later, although business remained active there was a good deal of profit-taking and buying became much more selective. It is generally realised that results of the Washington talks and devaluation of the £ cannot be expected to bring immediately a big expansion in exports, and that exports to America will have to be increased considerably to bring in the same dollar income as before.

Gains have been recorded by leading shares of companies connected with chemical industry, particularly those which have a large export trade. Imperial Chemical have risen by 1s. 3d. to 46s. 9d., British Aluminium by 9d. to 43s. 9d., British Oxygen by 1s. 3d. to 96s. 3d., Associated Cement by 1s. to 78s. 9d., and Dunlop Rubber by 1s. 6d. to 66s. 3d. Biggest gains were in shares of companies which have assets and trading interests in the dollar countries. Turner & Newall, for instance, advanced 4s. to 83s. 9d., while United Molasses at 43s. 9d. were nearly 2s. higher, and Borax Consolidated rose another 3s. 1½d. to 60s. 7½d.

British Plaster Board gained 6d. to 15s. 6d. and the 4s. units of the Distillers at 29s. 6d. were helped by the prospect of increased sales to the U.S., and also by the statements at the recent annual meeting, showing the diversity of the company's interests. An advance of 1s. to 16s. 6d. in Beechams deferred shares was attributed to the view that the depreciation of sterling will mean expansion of the group's export business.

Paint shares were also favoured because of their export and overseas interests. Pinchin Johnson rose 1s. 6d. to 37s. 9d., and Jenson & Nicholson gained 1s. at 27s. Elsewhere, Monsanto Chemical have risen to 51s. 10½d. Wall Paper Manufacturers deferred shares were 6d. up at 41s.; De La Rue have been firm at 26s. 3d.; Kleeman improved to 11s., and other shares of companies connected with plastics were also better. British Xylonite jumped 8s. 9d. to 90s.

Shares of companies mainly identified with home trade also participated in the upward movement. Boots Drug were better at 51s. 3d., Lever & Unilever at 42s. 6d. were litte changed on baance, and Glaxo Laboratories were maintained at £19¾, being firmly held owing to market talk of share bonus possibilities. Triplex Glass improved to 21s. 3d. Iron and steel shares were well supported; Dorman Long at 31s. 6d., United Steel at 27s. 6d. and Stewarts & Lloyds at 54s. 6d. were all better.

There were big rises in oil shares, Anglo-Iranian gaining nearly 10s. at £7⅞.

Organic Fluorine Compounds

A SUMMARY of the researches carried out at Birmingham University in the session 1947-48 is contained in the 19th annual report of the Joint Standing Committee for Research. The immediate funds available to the committee are only small, but are now supplemented by grants from the University's general funds.

Among the wide range of subjects covered, the Department of Chemistry has carried out investigations on polymeric carbohydrates as substitutes for blood plasma and has also completed work on pneumococcus and mycobacterium tuberculosis. A new range of organic fluorine compounds with possible application as non-inflammable lubricants, plastics, etc., resulted from work in fluorine chemistry.

Preliminary investigations into the chemical nature of the resins and the "free carbon" of coal tar, and studies of the vapour-liquid and liquid-liquid relations of the system acetic acid-water-ethyl acetate, were carried out by the Department of Chemical Engineering.

Law and Company News

Commercial Intelligence

The following are taken from the printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described herein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

RESINITE PRODUCTS, LTD., London, W.C. (M., 24/9/49.) Manufacturers of plastic mouldings, etc. August 16, £4000 debenture to Denny Mott and Dickson, Ltd.; general charge. *——. December 31, 1948.

Mortgage Satisfactions

LIVINGSTON REFRACTORIES, LTD., London, E.C. (M.S., 24/9/49.) Satisfactions August 20, of first and second series of debentures, both registered April 30, 1940.

MIDLAND TAR DISTILLERS, LTD., Birmingham. (M.S., 24/9/49.) Satisfaction August 17, of debenture stock registered August 6, 1936, to the extent of £8500.

Increases of Capital

The following increases in capital have been announced: BEECHAM RESEARCH LABORATORIES, LTD., from £50,000 to £100,000. BUSH, BEACH & GENT, LTD., from £20,000 to £50,000. GREENWOOD RAWLINS & CO., LTD., from £2000 to £5000. LONDON FUMIGATION CO., LTD., from £1000 to £20,000. STANDARD OIL CO. (MALTA), LTD., from £50,000 to £100,000.

Changes of Name

The following changes in name have been announced: DEO-DIS SERVICE, LTD., 23 Park Row, Leeds 1, to Convendo, Ltd.; FAIRBANK KIRBY (WHOLESALE), LTD., 7 Ropery Street, Grimsby, to Fairbank Kirby, Ltd.; L. HOLMES TRADING CO., LTD., 7/8 Poultry, E.C.2, to R. Fisher (London), Ltd.; MERSEY SOAP CO., LTD., Unilever House, Blackfriars, E.C.4, to D. & W. Gibbs (U.K.), Ltd.

New Registrations

Blue Farm and Lime Services Company, Ltd.

Private company. (472,886.) Capital £5000. Manufacturers of agricultural lime, fertilisers, manures, chemicals. Directors: G. B. Bull and Mrs. M. L. Bull, Mrs. M. Hinsull. Reg. office: 11 Northolt Grove, Great Barr, Birmingham, 22a.

B. Fillingham, Ltd.

Private company. (472,611). Capital £100. Manufacturers of weedkillers, insecticides, disinfectants, agricultural and other chemicals, manures, fertilisers, etc. Secretary: C. E. Bream. Reg. office: Bank Chambers, Town Hall Square, Leicester.

Industrial Fluids, Ltd.

Private company. (472,910). Capital £10,075. Chemists, oil refiners, oil and colour men, manufacturers in chemical, oil, industrial preparations and preparations for de-misting glass, anti-freeze products, etc. Reg. office: Ibex House, Minories, E.C.

R. E. Pickstone, Ltd.

Private company. (472,597). Capital £100. To develop chemical processes and products, etc. Directors: R. E. Pickstone, J. D. Stalker. Reg. office: 1 Chattern Road, Ashford, Middlesex.

Sully Alginates, Ltd.

Private company. (472,776). Capital £5000. Chemical engineers, chemical manufacturers, manufacturers of marine vegetation and chemicals derived therefrom, etc. Directors: C. W. Bonniksen and J. G. Cronk. Solicitor: M. A. Coombes, 119 High Street, Oxford.

ASLIB President's Protest

THE idea of an Association of Special Libraries and Information Bureaux was born 25 years ago, when a conference was held at which information officers mainly interested in metallurgy met to discuss problems of common interest to all, said Dr. Percy Dunsheath in his presidential address to ASLIB recently.

Asserting that library facilities in science and technology were a disgrace to Britain, Dr. Dunsheath called on the Government to provide a new library in the centre of London "conceived on a grand scale."

Company Meeting

THE DISTILLERS CO., LTD.

THE 72nd annual general meeting of the company was held in the North British Station Hotel, Edinburgh, on Friday, September 16, 1949, when the chairman, Mr. H. J. Ross, presided.

The chairman said:—

Once again I have to open my remarks to you on a sad note. It was only a year ago that Mr. John Barr Cumming, managing director of John Walker & Sons of Kilmarnock and London, was elevated to a seat on the board of the parent company, and not long afterwards he was stricken with a serious illness from which he succumbed, after a very gallant fight, in June of this year. His passing is a severe loss to the company.

Since our last annual meeting, Major Ball, D.S.O., M.C., has been appointed a member of the management committee, and his specialised knowledge of plastics, chemicals, etc., should prove, and indeed is proving to be a distinct acquisition to the deliberations of the committee.

The addition of three new directors to the board also falls to be recorded. These are all full-time executives who have grown up in the service of our subsidiary companies, and whose promotion is the reward of merit. They are, messrs. S. H. Hastie, E. Stein, and W. Walker, whose designations are stated in the report, and whose appointments you will be asked to confirm later in the meeting.

Profits and Taxes

From the statement of accounts you will have noted that, for the year to March 31, 1949, the manufacturing and trading profits of the company and its subsidiary companies, including an item of £149,756 for inter-company profits in the stock valuations of subsidiary companies released during the year, amounted to £10,361,857. To this is added: (1) Income from trade investments £324,956, (2) income from other investments including British Government Securities £400,673, and (3) provisions for taxation made in previous years not required and released £291,094, making the total revenue £11,378,580.

Taxation, under the headings of income tax and profits tax required £5,479,939, and after all provisions for depreciation, writtings off, and allowance for interests of outside shareholders in subsidiary companies, the net profit attributable to the group amounted to £4,756,623, as against a corresponding figure in the previous year of £5,303,510.

There was transferred to the general reserves of subsidiary companies amounts totalling £644,295, and the directors have agreed to appropriate £773,754 to general reserve, and £275,000 to superannuation and provident reserve, both in the books of the parent company. At the same time, the directors agreed to take from investment reserve a sum of £100,000, and to apply this in reducing the book values of certain investments in subsidiary companies.

At this stage, there was available £3,163,574, being sufficient for the dividends distributed or recommended, and to increase carry forwards from £3,425,083 to £4,243,398. The latter figure comprises £1,001,889 by the parent company, and £3,241,509 in the books of subsidiary companies.

Dividend

The dividend on the ordinary stock in respect of the year to March 31, 1949, is 1s. 1 1/5d. per unit of 4s., the same as for the previous year.

Apart altogether from the national policy of restriction of dividends, the board has had to have regard to the somewhat heavy contingent liabilities in respect of uncalled capital on investments, and for commitments for capital expenditure, all as mentioned in the notes attached to the accounts. The board deems it desirable to mention again that the costs of the expansion programme will, when completed, prove to be in excess of the estimates.

The company's legal balance sheet calls for the following comments:—

(1) The general capital reserve is now £1,324,098. The increase here is mainly attributable to the credit for profits on certain investments sold during the war.

(2) The revenue reserves, including undistributed profit, total £14,733,432.

(3) Investments in subsidiary companies increased during the year by £598,993. The main items contributing to this are as follows:—

(a) The subscription of additional capital to one of the subsidiary companies in the industrial group towards financing the costs of further development of that company.

(b) The acquisition of the firm of R. G. Abercrombie & Company, Distillers' and Brewers' Engineers, Alloa, and the creation, in collaboration with other interests, of a subsidiary company with a capital of £25,000, of which 80 per cent is held by The Distillers Company, Ltd.

(c) The investment in Uni-Be Bakers Supplies, Ltd. Here the capital is £50,000 of which 60 per cent is held by The Distillers Company, Ltd.

and

(4) There is a substantial reduction in the book value of quoted investments, under the heading of "Current Assets" in the balance sheet. Certain holdings of gilt edged securities and equity shares of British companies have been sold, mainly to finance loans to subsidiary companies for the expansion programme. The market value of the remaining holdings was below book value at the date of balance, but, in the case of trade investments, there was a very substantial surplus over book values. Having regard to this, the board did not consider it necessary to write down the value of quoted investments.

Reserves and Assets

Turning now to the consolidated balance sheet, it is interesting to note the increases in lands and buildings and in plant and machinery, due to the expansion programme. The effects of the appropriations to reserves and the increases in carry forwards are reflected in the comparative figures showing increases for both capital and revenue reserves. The strength of the organisation is clearly shown with current assets over £57 million and current liabilities of under £9.8 million.

It is appropriate to mention that the liquidation of W. P. Lowrie & Co., Ltd., and the transfer of its assets to James Buchanan & Co., Ltd., has brought about a reduction of £983,729 in the group's revenue reserves, with a corresponding increase in the group's capital reserves.

During the year, the board received an actuarial report upon the group superannuation and provident scheme. After taking into account the income tax position which would be applicable if a separate trust was established, the valuation has disclosed that the existing reserves, under this heading, are adequate —in fact, there is a surplus.

The board will shortly have under consideration the formation of such a trust to administer certain provisions of the scheme.

In recent years, the stockholders have been informed that the board desired to re-organise the capital structure of the company, at least to some extent, so as to bring the issued capital more in line with the assets, and with the earnings. The proposal as announced—to capitalise £7,512,923 of the company's general reserve, and to appropriate this to the ordinary stockholders on the register at September 30, 1949, by the allotment of one new ordinary share (afterwards to be converted into stock) for every two pounds of ordinary stock held—has received the sanction of the capital issues committee of the Treasury.

Arrangements are being made to hold an extraordinary meeting on Thursday, November 3, 1949, to consider this proposal, as well as one to increase the capital of the company from £20 million to £35 million.

The transfer of £7,512,923 from the general revenue reserve of the parent company leaves a substantial figure at credit thereof, and the board considers that this, in conjunction with the reserves of subsidiary companies, leaves the organisation strong, and in a position to withstand such contingencies as may arise in the future.

In my statement last year I referred to the release of 250,000 tons of cereals to the industry for the period to April 30, 1949, and for which quantities, licences were issued to maintain continuity of operations at distilleries.

This release was followed in February of this year by an allocation of 300,000 tons, equal, you might say, to the full pre-war rate of distilling, but, to achieve this, we were obliged to pledge ourselves to still further increase our exports of old whisky.

Home Market

Reference was also made last year to the limited and indeed meagre allocation being made available to the home consumer. In the year now under review, the position has not improved.

In terms of the arrangement with the Ministry of Food which came into operation on May 1, 1948, releases for the home trade had to be confined to an overall figure for the trade of two million proof gallons, and, although the official figure of releases showed that total to have been considerably exceeded, our companies faithfully observed the arrangement.

At a meeting with the Ministry of Food in February, 1949, the necessity for increased home trade supplies was submitted with the utmost emphasis. Once again, however, the interest of the home market had to be submerged in the national necessity for increased supplies to hard currency export markets, and, for the twelve months ending April 30, 1950, home trade releases have again been pegged at two million proof gallons.

I need not reiterate the feelings of the board which I expressed to you last year, except to repeat that it is our aim and desire to have the position remedied at the earliest possible moment.

The rate of duty remains at the ridiculous figure of £10 10s. 10d. per proof gallon. Continuance of taxation at this

penal rate—equal to 24s. 7d. per bottle—coupled with the restricted releases already referred to, can only result in the strangulation of our home trade interests. The representations to the Chancellor of the Exchequer made during the course of the year must be intensified, not only on our part, but by ancillary interests, including the consumer public.

To return to exports, as I think is generally well known, the U.S.A. and Canada are the most important hard currency markets upon which we are asked to concentrate our efforts. While our group of companies will naturally carry out their share of the undertaking made between the Ministry of Food and The Scotch Whisky Association, it has been impressed on the Minister that consideration must now be given, not only to the long suffering home consumer, but also to certain other soft currency markets which have been deprived of their full requirements for years.

What we must ever impress upon the Government of this country is that the Scotch whisky industry, and your company in particular, has been responsible for creating a world-wide trade in an article, the quality of which is second to none.

High Duty

The undoubted supremacy of Scotch whisky is acknowledged everywhere, but continued shortages will assuredly open the door to substitutes of one kind or another, of which there are many in various countries of the world. Particularly has this been the case in the home market, due largely to the exorbitant rate of duty.

For economic reasons, certain countries, notably the South American Republics, have been closed to us as markets for our brands of Scotch whisky.

The arrangements we have made to endeavour to protect our valuable trade in South Africa appear to have excited comment in some quarters. As you will be aware, the South African Government, in the interests of their internal economy, recently prohibited the importation of a long list of luxuries, including whisky.

Our efforts to be allowed to export even a token quantity having met with no success, we were informed that the only possible way in which a resumption of trading might be achieved would be for us to agree to leave our money in South Africa to be invested in Union Government and Municipal Securities, or other approved investments, for a period not yet known.

Naturally, the prospect of tying up our resources in such a manner over an indefinite period held no particular appeal, but, as the only alternative left to us was the probable loss of what has been for long years a most valuable market for Scotch whisky, we decided to give this blocked fund system a trial. The matter was therefore remitted to the Bank of England Exchange Control, and the necessary permission granted.

I am glad to be able to record once more that the demand for the group's gin brands continues strong—particularly the leaders—Gordon's and Booth's, which reflects the public's appreciation of the high standard of quality which it is our endeavour always to maintain.

In addition to the continuing efforts of our gin companies to expand exports to hard currency markets, we have in the U.S.A. our own rectifying plant, where our sales are running at a higher level than they have ever done, and those of our directors and others who have recently been in America have nothing but praise for the condition and operation of our factory at Linden, New Jersey.

Production at the company's yeast factories was at a high level throughout the year, but costs have again tended to rise. It is satisfactory to record that the Ministry has given permission for the erection of the new factory at Bristol, and every effort will be made to have it in operation within a reasonable period.

The United Yeast Company Ltd., and its associated companies, who are distributors of the company's yeast to every district of the United Kingdom, no matter how remote, as well as engaging in the important business of providing most materials used by bakers, have well maintained their progressive position with satisfactory results.

Industrial Section

The past year has been a difficult one on the industrial side of the company's business, but, on the whole, our combined results have been satisfactory.

The demand for industrial alcohol and chemical products has been substantially maintained, and I am glad to say that, during the course of the first half of 1949, all Government controls, which have been in force in respect of most of our manufacturing and selling operations during and since the war, were removed.

The world price of one of our important raw materials, molasses, fell very sharply at the end of last year, so that, notwithstanding the necessary liquidation of high-priced stocks, the recent purchase at

much lower prices has enabled us to make substantial reductions in selling prices of the materials derived therefrom, and thus bring them more into line with the increasingly competitive conditions following upon the disappearance of the sellers' market.

The indications are that molasses is likely to remain in free supply at reasonable prices for some time to come, which will enable us to make further reductions as and when the old stocks are disposed of.

The new project at Grangemouth for producing chemicals from petroleum, which development you will recall is being financed equally between the Anglo-Iranian Oil Company, Ltd., and ourselves, is making steady progress. Although the rising costs of constructional materials and long delivery dates still present serious problems, nevertheless, every effort is being made to adhere to the original completion date of January, 1951.

Expansion Scheme

The penicillin factory at Speke has had a satisfactory year, and the entire output has been fully sold. Plans are now in course of execution for considerably increasing the existing capacity, having regard to what we believe will be the future demand for penicillin, and also to equip the company with the most economic basis of manufacture in order to meet increasingly competitive conditions in world markets. The programme also provides for the marketing of new materials in the course of next year.

The plastics industry, as a whole, has suffered a sharp set-back during the past year, due, in no small measure, to the operation of the purchase tax as well as the high cost of essential raw materials. In recent months, however, the prices of some of these raw materials have eased, and there have been signs of an improvement in demand.

In the meantime, our new factory at Barry is virtually complete, and the gradual transfer of manufacturing operations from existing plants to that centre is now in progress. This large and modern unit should enable us to achieve further economies in production cost, and also considerably to expand and broaden the present range of plastic materials.

The Geon polyvinyl chloride plant at Barry enjoyed a substantial scale of production during the past year, despite the general contraction in demand for plastic materials, and the quality of the range of products now being marketed by the Geon company has enabled us steadily to increase our sales both in the home market and for export.

Reference has been made previously to our investments in industrial undertakings overseas, particularly in South Africa and Australia. I am glad to say that our trading operations in these countries are showing very satisfactory results, and we have under constant review the broadening of our activities to enable our company to participate in the growing demand for industrial chemicals, which it is felt will arise from the general development of those countries.

Your company is still maintaining an extensive research programme, which stockholders will recognise is an essential background to the large-scale developments in which we are engaged.

The company has not yet benefited from the anticipated reasonable return from expenditure on the major part of the expansion scheme, and it may be some time before it does, but it should be remembered that it will be necessary to continue, over an extended period, the board's established policy of ploughing back a substantial part of the profit earned therefrom.

In announcing the proposal with regard to the alteration in the capital structure, the board deemed it advisable, therefore, to issue a statement that it must not be assumed there would be an increase in the amount paid out by way of dividend.

It is satisfactory to note, however, that so far as the current year has progressed, the profits earned by the company are well up to the standard of the year to March 31, 1949.

It is again a pleasure for me to be able to pay tribute to the services of our staff. Relations with both works and office staffs continue to be excellent, and the board's appreciation has again been translated into the form of a small monetary bonus, 7½ per cent having been paid for the year to March 31, 1949, as against 5 per cent for the previous year.

In intimating a repetition of the 7½ per cent rate for the current year, it was made clear that this is not to be looked upon in any way as a permanent addition to either wage or salary.

In other words, when times are good and conditions justify it, the board is only too glad to consider rewarding loyalty and devotion in some practical manner. If, on the other hand, we were to run into a depression, with a consequent drop in profits, I feel sure we could count on the same loyalty and devotion even though no additional monetary reward was possible.

The report was adopted.

Next Week's Events

MONDAY, SEPTEMBER 26

British Ceramic Society

Birmingham: Assembly room, Chamber of Commerce, New Street, 2 p.m. Autumn meeting. E. V. Bland: "Some Experiences with Mechanical Transport in a Clay Works."

International Leather Industry Exhibition

Milan, Italy: Daily, until October 2.

British Rheologists' Club

Bristol: University. General conference and annual general meeting (until September 28). Opening session on Rheology of Solids introduced by the president, Prof. N. F. Mott.

Institution of Works Managers

Sheffield: Royal Victoria Station Hotel, 7 p.m. Annual general meeting (Sheffield branch).

TUESDAY, SEPTEMBER 27

Radiolympia, National Radio Exhibition

London: Olympia. Daily, until October 8.

Institution of Works Managers

Leicester: Bell Hotel, 7 p.m. Discussion. J. Ayres: "The Works Manager," (Leicester branch.)

Liverpool: Reece's Restaurant, Parker Street, 6.30 p.m. Annual general meeting and supper. (Merseyside branch.)

WEDNESDAY, SEPTEMBER 28

Society of Chemical Industry

London: William Beveridge Hall, The Senate House, University of London. The Food Group: A Symposium on Amino acids and Protein hydrolysates. Opening address by Prof. E. C. Dodds, followed by papers and discussions. (Until September 30.)

International Motor Exhibition

London: Earls Court. Daily, until October 8.

National Smoke Abatement Society

Harrogate: Lounge Hall, Royal Baths. Wednesday, 3.30 p.m. Presidential address, Lord Simon of Wythenshawe; 4 p.m. Annual general meeting; 8.30 p.m. Reception by Mayor of Harrogate. (September 29-October 1, annual conference: papers, discussions and visits, etc.)

Society of Chemical Industry

London: Institution of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. Members of the Plastics and Polymer Group invited by the Plastics Institute to attend a lecture by Mr. Gordon Russell on "Industrial Design and Plastics."

THURSDAY, SEPTEMBER 29

Sir John Cass Technical Institute

London: Jewry Street, Aldgate, E.C.3. 6 p.m. Eric Walker: "Industrial Law," first of a series of 12 lectures.

Royal Statistical Society

Sheffield: The University, St. George's Square. 6.30 p.m. Twenty-sixth meeting of the group. D. R. G. Davies: "The Application of Statistical Methods in American Steel Plants."

FRIDAY, SEPTEMBER 30

Royal Statistical Society

Birmingham: Chamber of Commerce, New Street. 6.30 p.m. Twenty-ninth meeting of the group. Dr. J. Rodgers (chairman): "Statistics as an Aid to Productivity."

Industrial Chemistry Congress

AT the 22nd International Industrial Chemistry Congress, to be held at Barcelona, Spain, from October 23-30 important papers to be presented and discussed include: "Copolymerisation," by Prof. Manuel Lora Tamayo, vice-rector of the Central University, Barcelona; "Development of a Great Medicament—The Application of Penicillin," by M. H. Pénau, former president of the Spanish Academy of Pharmacy; "Delayed Action of Penicillin," by M. M. Janob, professor of the faculty of pharmacy of Parish University; "Spanish Petrol Economics," by S. Exc. Don. Demetrio Carceller, former director-general of the Compañia Española de Petroleos, S.A.; "New Trends in Industrial Chemical Equipment," by Dr. E. H. T. Hoblyn (secretary, BCPMA); "The Rôle of Chemistry in the Vaporisation of Combustibles," by Prof. C. Padovani, director of the Combustibles Experimental Station, Milan, Italy.

Numerous prizes are to be awarded for the best paper presented at the congress, the best paper on chemical engineering and equipment, the best work relating to spectro-photometric dosage of vitamin A.

Prices of British Chemical Products

Further Fluctuation in Lead Chemical Values

ALMOST all sections of the industrial chemicals market have been active during the past week with home consumers showing more interest in new contract business. Export inquiry has expanded particularly from the hard currency countries and the immediate outlook as far as export demand is concerned is reassuring. Higher non-ferrous metal prices anticipated as a result of the suspension of metal sales from midnight on September 17 until September 22 and following the devaluation of sterling were expected to affect the prices of the chemical compounds. No information, however, was available at the time of this report. To what extent the Coal Tar products market would benefit by the more favourable exchange rate remains to be seen.

MANCHESTER.—Home-trade buying on the Manchester chemical market during the past week has been fairly active and deliveries of the alkalis and other heavy products are going forward steadily to the textile and allied industries and to the other consuming outlets. The devaluation of the pound is expected to be reflected in the prices of certain imported chemicals, though it is early yet to say what the actual effects will be. A fair trade is passing in some of the fertiliser materials, with the demand for the tar products variable, though most of the light distillates are being taken up in fair quantities.

GLASGOW.—Business in general in the Scottish heavy chemical market remains fairly quiet. A greater tendency has been observed for price inquiries for local business and for export the market in general has been very quiet.

Price Changes

Rises: Caustic soda, pyridine.

Reductions: Arsenic, cobalt oxide, cresylic acid, toluol.

General Chemicals

Acetic Acid.—Per ton: 80% technical, 1 ton, £61; 80% pure, 1 ton, £66; commercial glacial 1 ton £71; delivered buyers' premises in returnable barrels; in glass carboys, £7; demijohns, £11 extra.

Acetic Anhydride.— Ton lots, d/d, £101 per ton.

Acetone.—Small lots: 5 gal. drums, £90 per ton; 10 gal. drums, £85 per ton. In 40/45 gal. drums less than 1 ton, £70 per ton; 1 to 9 tons, £69 per ton; 10 to 50 tons, £68 per ton; 50 tons and over £67 per ton.

Alcohol, Industrial Absolute.—50,000 gal. lots, d/d, 2s. 1d. per proof gallon; 5000 gal. lots, d/d, 2s. 2½d. per proof gal.

Alcohol, diacetone.—Small lots: 5 gal. drums, £133 per ton; 10 gal. drums, £128 per ton. In 40/45 gal. drums: less than 1 ton, £113 per ton; 1 to 9 tons, £112 per ton; 10 to 50 tons, £111 per ton; 50 to 100 tons, £110 per ton; 100 tons and over, £109 per ton.

Alum.—Loose lump, £17 per ton, f.o.r. MANCHESTER: Ground, £17 10s.

Aluminium Sulphate.—Ex works, £11 10s. per ton d/d. MANCHESTER: £11 10s.

Ammonia, Anhydrous.—1s. 9d. to 2s. 3d. per lb.

Ammonium Bicarbonate.—2 cwt. non returnable drums; 1 ton lots £40 per ton.

Ammonium Carbonate.—1 ton lots; MANCHESTER: Powder, £52 d/d.

Ammonium Chloride. — Grey galvanising, £22 10s. per ton, in casks, ex wharf. Fine white 98%, £21 to £25 per ton. See also Salammoniac.

Ammonium Nitrate.—D/d, £18 to £20 per ton.

Ammonium Persulphate.—MANCHESTER: £5 per cwt. d/d.

Ammonium Phosphate.—Mono- and di-, ton lots, d/d, £78 and £76 10s. per ton.

Amyl Acetate.—In 10-ton lots, £171 10s. per ton.

Antimony Oxide.—£140 per ton.

Antimony Sulphide.—Golden, d/d, as to quantity, etc., 4s. to 5s. per lb.

Arsenic.—Per ton, £36, ex store.

Barium Carbonate.—Precip., d/d; 2-ton lots, £25 15s. per ton, bag packing, ex works.

Barium Chloride.—£35 to £35 10s. per ton.

Barium Sulphate (Dry Blanc Fixe).—Precip., 4-ton lots, £26 10s. per ton d/d; 2-ton lots, £26 15s. per ton.

Bleaching Powder. Spot, 35/37%, £11 to £11 10s. per ton in casks (1 ton lots).

Borax.—Per ton for ton lots, in free 140 lb. bags, carriage paid: Anhydrous, £46; in 1-cwt. bags, commercial, granulated, £27; powdered, £30; extra fine powder, £31; B.P., crystals, £39; powdered, £39 10s.; extra fine, £40 10s. Borax glass, per ton in free 1-cwt. waterproof paper-lined bags, for home trade only, carriage paid: lump, £77; powdered, £78.

Boric Acid.—Per ton for ton lots in free 1-cwt. bags, carriage paid: Commercial, granulated, £48; crystals, £53; powdered, £51-£53; extra fine powder, £53. B.P., crystals, £61; powder, £62; extra fine, £64.

Butyl Acetate BSS.—£149 10s. per ton, in 10-ton lots.

Butyl Alcohol BSS.—£145 10s per ton, in 10-ton lots.

Calcium Bisulphide.—£6 10s. to £7 10s. per ton f.o.r. London.

Calcium Chloride.—70/72% solid, £8 per ton, in 4 ton lots.

Charcoal, Lump.—£25 per ton, ex wharf. Granulated, £30 per ton.

Chlorine, Liquid.—£28 per ton d/d in 16/17-cwt. drums (3-drum lots).

Chrometan.—Crystals, 5½d. per lb.

Chromic Acid.—1s. 10d. to 1s. 11d. per lb., less 2½%, d/d U.K.

Citric Acid.—Controlled prices per lb., d/d buyers' premises. For 5 cwt. or over, anhydrous, 1s. 6½d., other, 1s. 5.; 1 to 5 cwt., anhydrous, 1s. 9d., other, 1s. 7d. Higher prices for smaller quantities.

Cobalt Oxide.—Black, delivered, 7s. per lb.

Copper Carbonate.—MANCHESTER: 1s. 6d. per lb. (Nominal.)

Copper Chloride.—(53 per cent), d/d, 1s. 9d. per lb. (Nominal.)

Copper Oxide. — Black, powdered, about 1s. 4½d. per lb. (Nominal.)

Copper Nitrate.—(53 per cent), d/d, 1s. 7d. per lb. (Nominal.)

Copper Sulphate.—£36 5s. per ton f.o.b., less 2%, in 2-cwt. bags. (Nominal.)

Cream of Tartar.—100%, per cwt., about £7 8s. per 1-2 cwt. lot, d/d.

Ethyl Acetate.—10 tons and upwards, d/d, £103 10s. per ton.

Formaldehyde.—£31 per ton in casks, according to quantity, d/d. MANCHESTER: £32.

Formic Acid.—85%, £64 per ton for ton lots, carriage paid. 90%, £67 5s. per ton.

Glycerine.—Chemically pure, double distilled 1260 s.g. £123 per cwt. Refined pale straw industrial, 5s. per cwt. less than chemically pure.

Hexamine.—Technical grade for commercial purposes, about 1s. 4d. per lb.; free-running crystals are quoted at 2s. 1d. to 2s. 3d. per lb.; carriage paid for bulk lots.

Hydrochloric Acid.—Spot, 7s. 6d to 8s 9d. per carboy d/d, according to purity, strength and locality.

Hydrofluoric Acid.—59/60%, about 1s. to 1s. 2d. per lb.

Hydrogen Peroxide.—1s. 0½d. per lb. d/d, carboys extra and returnable.

Iodine.—Resublimed B.P., 10s. 4d. to 14s. 6d. per lb., according to quantity.

Iron Sulphate.—F.o.r. works, £3 15s. to £4 per ton.

Lactic Acid.—Pale, tech., £80 per ton; dark tech., £70 per ton ex works; barrels returnable.

Lead Acetate.—White, £107 per ton. (Nominal.)

Lead Carbonate.—British dry, ton lots, d/d, £115 10s. (Nominal.)

Lead Nitrate.—About £116 per ton d/d in casks. MANCHESTER: £94. (Nominal.)

Lead, Red.—Basic prices per ton: Genuine dry red lead, £105 10s.; orange lead, £117 10s. Ground in oil: red, £129 5s. orange, £141 5s. Ready-mixed lead paint: red, lots of 20 gals. and under 160 gals. in 1 gal. tins uncrated, £2 5s. per gal.; orange 3s. 6d. per gal. extra over the price for red. (Nominal.)

Lead, White.—Dry English, in 8-cwt. casks, £115 10s. per ton. Ground in oil, English, under two tons, £135 10s. (Nominal.)

Lime Acetate.—Brown, ton lots, d/d, £18 to £20 per ton; grey, 80-82 per cent, ton lots, d/d. £22 to £25 per ton.

Litharge.—£103 per ton.

Lithium Carbonate.—7s. 9d. per lb. net.

Magnesite.—Calcined, in bags, ex works, £27.

Magnesium Carbonate.—Light, commercial, d/d, £70 per ton.

Magnesium Chloride.—Solid (ex wharf), £20 to £25 per ton.

Magnesium Oxide.—Light, commercial, d/d, £160 per ton.

Magnesium Sulphate.—£12 to £14 per ton.

Mercuric Chloride.—Per lb., lump, 7s. 4d.; smaller quantities dearer.

Mercurous Chloride.—8s. to 9s. per lb., according to quantity.

Mercury Sulphide, Red.—Per lb., from 10s. 3d. for ton lots and over to 10s. 7d. for lots of 7 to under 30 lb.

Methanol.—Pure synthetic, d/d, £28 to £38 per ton.

Methylated Spirit.—Industrial 66° O.P. 100 gals., 3s. 7½d. per gal.; pyridinised 64° O.P. 100 gal., 3s. 8½d. per gal.

Nickel Sulphate.—F.o.r. works, 3s. 4d. per lb. (Nominal.)

Nitric Acid.—£24 to £26 per ton, ex works.

Oxalic Acid.—£128 to £133 per ton packed in free 5-cwt. casks.

Paraffin Wax.—Nominal.

Phosphoric Acid.—Technical (S.G. 1.500), ton lots, carriage paid, £61 per ton; B.P. (S.G.1.750), ton lots, carriage paid, 1s. 1d. per lb.

Phosphorus.—Red, 3s. per lb. d/d; yellow, 1s. 10d. per lb. d/d.

Potash, Caustic.—Solid, £65 10s. per ton for 1-ton lots; flake, £76 per ton for 1-ton lots. Liquid, d/d, nominal.

Potassium Bichromate. — Crystals and granular, 9⅝d. per lb.; ground, 10⅝d. per lb., for not less than 6 cwt.; 1-cwt. lots, ½d. per lb. extra.

Potassium Carbonate.—Calcined, 98/100%, £64 per ton for 1-ton lots, ex store; hydrated, £58 for 1-ton lots.

Potassium Chlorate.—Imported powder and crystals, nominal.

Potassium Chloride.—Industrial, 96 per cent, 6-ton lots, £16.10 per ton.

Potassium Iodide.—B.P., 11s. 1d. to 12s. per lb., according to quantity.

Potassium Nitrate.—Small granular crystals, 76s. per cwt. ex store, according to quantity.

Potassium Permanganate.—B.P., 1s. 7½d. per lb. for 1-cwt. lots; for 3 cwt. and upwards, 1s. 6d. per lb.; technical, £7 9s. 6d. to £8 3s. 0d. per cwt.; according to quantity d/d.

Potassium Prussiate.—Yellow, nominal.

Salammoniac.—First lump, spot, £48 per ton; dog-tooth crystals, £50 per ton; medium, £48 10s. per ton; fine white crystals, £21 to £25 per ton, in casks, ex store.

Salicylic Acid.—MANCHESTER: 1s. 11d. to 3s per lb. d/d.

Soda Ash.—58° ex depôt or d/d, London station, £7 12s. 6d. to £8 7s. 6d. per ton.

Soda, Caustic. — Solid 76/77%; spot, £20 14s. per ton d/d.

Sodium Acetate.—£41-£55 per ton.

Sodium Bicarbonate.—Refined, spot, £11 per ton, in bags.

Sodium Bichromate.—Crystals, cake and powder, 8d. per lb.; anhydrous, 7¼d. per lb., net, d/d U.K. in 7-8 cwt. casks.

Sodium Bisulphite. — Powder, 60/62%, £28 7s. 6d. per ton d/d in 2 ton lots for home trade.

Sodium Carbonate Monohydrate.—£25 per ton d/d in minimum ton lots in 2-cwt. free bags.

Sodium Chlorate.—£52 to £57 per ton.

Sodium Cyanide.—100 per cent basis, 8d. to 9d. per lb.

Sodium Fluoride.—D/d, £4 10s. per cwt.

Sodium Hyposulphite.—Pea crystals 22s. 6d. per cwt. (2-ton lots); commercial, 1-ton lots, £16 per ton carriage paid. Packing free.

Sodium Iodide.—B.P., 10s. 2d. per lb. to 12s. 1d. according to quantity.

Sodium Metaphosphate (Calgon).—Flaked, loose in metal drums, £103 ton.

Sodium Metasilicate.—£19 to £19 5s. per ton, d/d U.K. in ton lots.

Sodium Nitrate.—Chilean Industrial, 97-98 per cent, 6-ton lots, d/d station, £20 10s. per ton.

Sodium Nitrite.—£29 10s. per ton.

Sodium Percarbonate.—12½% available oxygen, £7 per cwt. in 1-cwt. drums.

Sodium Phosphate.—Di-sodium, £32 10s. per ton d/d for ton lots. Tri-sodium, £62 per ton d/d for ton lots.

Sodium Prussiate.—9d. to 9½d. per lb. ex store.

Sodium Silicate.—£6 to £11 per ton.

Sodium Silicofluoride.—Ex store, nominal.

Sodium Sulphate (Glauber Salt).—£8 per ton d/d.

Sodium Sulphate (Salt Cake).—Unground. £6 per ton d/d station in bulk. MANCHESTER: £6 10s. per ton d/d station.

Sodium Sulphide. — Solid, 60/62%, spot. £24 per ton, d/d, in drums; broken, £24 15s. per ton, d/d, in casks.

Sodium Sulphite.—Anhydrous, £29 10s. per ton; pea crystals, £20 10s. per ton d/d station in kegs; commercial, £12 to £14 per ton d/d station in bags.

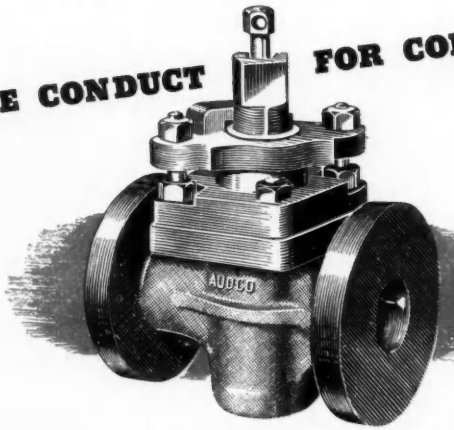
Sulphur.—Per ton for 4 tons or more, ground, £13 18s. 6d. to £16 3s. 6d., according to fineness.

Sulphuric Acid.—168° Tw., £6 2s. to £7 2s. per ton; 140° Tw., arsenic free £4 18s. 6d. per ton; 140° Tw., arsenious, £4 11s. per ton. Quotations naked at sellers' works.

Tartaric Acid.—Per cwt: 10 cwt. or more £8 10s.; 5 to 9 cwt. £8 12s.; 2 to 4 cwt. £8 14s.; 1 cwt. £8 16s.

Tin Oxide.—1-cwt. lots d/d £25 10s. (Nominal.)

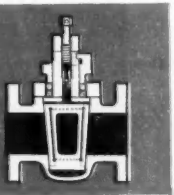
SAFE CONDUCT FOR CORROSIVE FLUIDS



Sulphate Resisting Type S.R.
Tested to 100 lbs./□" Air

For the safe and efficient handling of corrosive fluids,

Audco valves are made in a wide range of corrosion-resisting materials, specially designed to meet the many and varied requirements of the Chemical Industry.



Sectional elevation of Audco Screwed Valve with plug in closed position.

AUDCO
Lubricated
VALVES

DIRT CAN'T GET IN—FLUID CAN'T GET OUT

Audco's patented lubricating and plug-seating features ensure positive sealing, certain and easy operation, and low maintenance. The seats are always sealed by lubricant, ensuring rapid and positive closure when required.

Audley Engineering Co. Ltd., Newport, Shropshire

Titanium Oxide.—Comm., ton lots, d/d, (56 lb. bags) £102 per ton.

Zinc Oxide.—Maximum prices per ton for 2-ton lots, d/d; white seal, £66.; green seal, £65; red seal, £63 10s. (Nominal.)

Zinc Sulphate.—£31 per ton. (Nominal.)

Rubber Chemicals

Antimony Sulphide.—Golden, 4s. to 5s. per lb. Crimson, 2s. 7½d. to 3s. per lb.

Arsenic Sulphide.—Yellow, 1s. 9d. per lb.

Barytes.—Best white bleached, £8 3s. 6d. per ton.

Cadmium Sulphide.—6s. to 6s. 6d. per lb.

Carbon Bisulphide.—£37 to £41 per ton, according to quality, in free returnable drums.

Carbon Black.—6d. to 8d. per lb., according to packing.

Carbon Tetrachloride.—£56 to £59 per ton, according to quantity.

Chromium Oxide.—Green, 2s. per lb.

India-rubber Substitutes.—White, 10 5/16d. to 1s. 5½d. per lb.; dark, 10½d. to 1s. per lb.

Lithopone.—30%, £36 15s. per ton.

Mineral Black.—£7 10s. to £10 per ton.

Mineral Rubber, "Rupron."—£20 per ton.

Sulphur Chloride.—7d. per lb.

Vegetable Lamp Black.—£49 per ton.

Vermillion.—Pale or deep, 15s. 6d. per lb. for 7-lb. lots.

Nitrogen Fertilisers

Ammonium Sulphate.—Per ton in 6-ton lots, d/d farmer's nearest station, in October, £10 0s. 6d., rising by 1s. 6d. per ton per month to March, 1950.

Compound Fertilisers.—Per ton d/d farmer's nearest station, I.C.I. No. 1 grade, where available, £10 14s. 6d. I.C.I. Special No. 1, £15 11s., rising by 2s. 6d. per ton per month to June, 1950. National No. 2 raised from £10 8s. 6d. to £10 18s. per ton, due to increase in potash content, as notified in new Board of Trade Order.

"Nitro-Chalk."—£10 4s. per ton in 6-ton lots, d/d farmer's nearest station.

Sodium Nitrate.—Chilean for 6-ton lots d/d nearest station, £11 per ton.

Coal-Tar Products

Benzol.—Per gal. ex works: 90's, 2s. 6d.; pure, 2s. 8½d.; nitration grade, 2s. 10½d.

Carbolic Acid. — Crystals, 11½d per lb. Crude, 60's, 4s. 3d. MANCHESTER: Crystals, 10½d. to 1s. 0½d. per lb., d/d crude, 4s. 3d., naked, at works.

Creosote.—Home trade, 6½d. to 9½d. per gal., according to quality, f.o.r. maker's works. MANCHESTER: 6½d. to 9½d. per gal.

Cresylic Acid.—Pale, 98%, 3s. 9d. per gal.; 99%, 3s. 1d.; 99.5/100%, 4s. 4d. American, duty free, 4s. 2d., naked at works. MANCHESTER: Pale, 99/100%, 3s. 11d. per gal.

Naphtha.—Solvent, 90/160°, 2s. 10d. per gal. for 1000-gal. lots; heavy, 90/190°, 2s. 4d. per gal. for 1000-gal. lots, d/d. Drums extra; higher prices for smaller lots. Controlled prices.

Naphthalene.—Crude, ton lots, in sellers' bags, £8 1s. to £12 13s. per ton according to m.p.; hot-pressed, £14 15s. to £15 14s. per ton, in bulk ex works; purified crystals, £28 to £43 5s. per ton. Controlled prices.

Pitch.—Medium, soft, home trade, 100s. per ton f.o.r. suppliers' works; export trade, £6 to £7 per ton f.o.b. suppliers' port. MANCHESTER: 100s. f.o.r.

Pyridine.—90/140°, 22s. to 23s. per gal.; 90/160°, 21s. MANCHESTER: 19s. to 22s. 6d. per gal.

Toluol.—Pure, 3s. 2d. per gal.; 90's, 2s. 4d. per gal. MANCHESTER: Pure, 3s. 2½d. per gal. naked.

Xylol.—For 1000-gal. lots, 3s. 3½d. to 3s. 6d. per gal., according to grade, d/d.

Wood Distillation Products

Calcium Acetate.—Brown, £15 per ton; grey, £22.

Methyl Acetone.—40/50%, £56 to £60 per ton.

Wood Creosote.—Unrefined, from 3s. 6d. per gal., according to boiling range.

Wood Naphtha.—Miscible, 4s. 6d. to 5s. 6d. per gal.; solvent, 5s. 6d. to 6s. 6d. per gal.

Wood Tar.—£6 to £10 per ton.

Intermediates and Dyes (Prices Nominal)

***m*-Cresol** 98/100%.—Nominal.

***o*-Cresol** 30/31° C.—Nominal.

***p*-Cresol** 34/35° C.—Nominal.

Dichloraniline.—2s. 8½d. per lb.

Dinitrobenzene.—8½d. per lb.

Dinitrotoluene.—48/50° C., 9½d. per lb.; 66/68° C., 1s.

***p*-Nitraniline.**—2s. 5d. per lb.

Nitrobenzene.—Spot, 5½d. per lb. in 90-gal. drums, drums extra, 1-ton lots d/d buyers' works.

Nitronaphthalene.—1s. 2d. per lb.; P.G. 1s. 0½d. per lb.

***o*-Toluidine.**—1s. per lb., in 8/10-cwt. drums, drums extra.

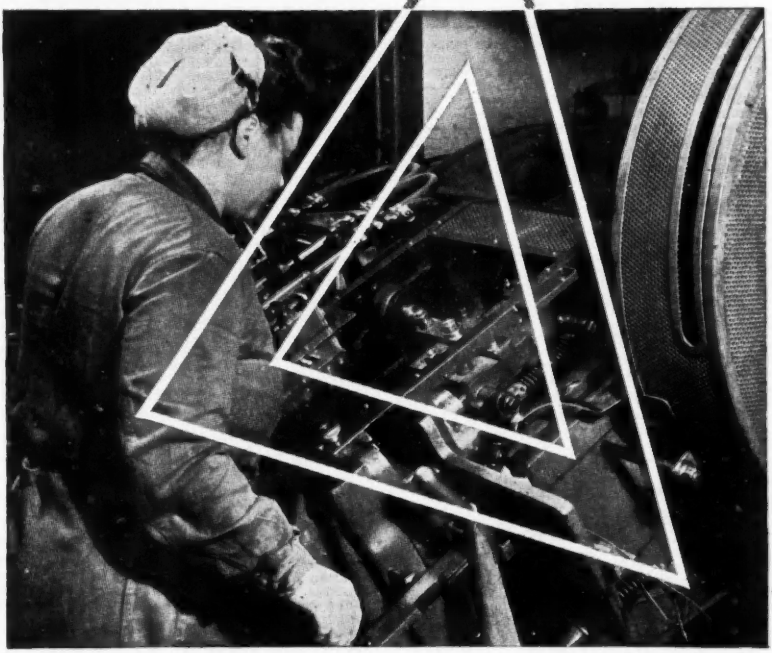
***p*-Toluidine.**—2s. 2d. per lb., in casks.

***m*-Xylidine Acetate.**—4s. 5d. per lb., 100%.

Latest Oil Prices

LONDON: September 21. Unrefined, per ton, naked ex works, linseed oil £126, foots £76; castor oil, first £98, second £91; rapeseed oil (Chinese) £130, rapeseen oil (other) £140. The prices of all other unrefined oils and fats remain unchanged. There is no change in the prices of refined oils until November 5.

SAFETY in industry



By courtesy of Scott & Turner Ltd.

with 'PERSPEX' machine guards

'Perspex' machine guards ensure perfect shadow-free visibility of all moving parts and provide a high degree of safety for operatives.

'Perspex' is the registered trade mark of the acrylic sheet manufactured by I.C.I. Ltd.

ICI

P.341

IMPERIAL CHEMICAL INDUSTRIES LIMITED
LONDON, S.W.1

CLASSIFIED ADVERTISEMENTS

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Great Possibilities for

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VAST and far-reaching developments in the range of peacetime productions and markets of the Chemical Industry mean that the profession of Chemical Engineering will be of great importance in the future and one which will offer the ambitious man a career of outstanding interest and high status. The T.I.G.B. offers a first-class training to candidates for the Chemical Engineering profession.

Enrol with the T.I.G.B. for the A.M.I.Chem.E. Examinations in which home-study students of the T.I.G.B. have gained a record total of passes including—

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Write to-day for the "Engineers' Guide to Success"—free—containing the world's widest choice of Engineering courses—over 200—the Department of Chemical Technology, including Chemical Engineering Processes, Plant Construction, Works Design and Operation, and Organisation and Management—and which alone gives the Regulations for A.M.I.Chem.E., A.M.I.Mech.E. A.M.I.E.E., C. & G., B.Sc., etc.

THE TECHNOLOGICAL INSTITUTE OF GREAT BRITAIN

219 Temple Bar House, London, E.C.4

THE INSTITUTION of CHEMICAL ENGINEERS

EXAMINATION, 1950

Application forms, (returnable 1st December, 1949) and particulars of the Associateship-Membership Examination for 1950 may be obtained from the Hon. Registrar, **INSTITUTION OF CHEMICAL ENGINEERS, 56, VICTORIA STREET, WESTMINSTER, LONDON, S.W.1.**

SITUATIONS VACANT

None of the vacancies in these columns relates to a man between the ages of 18 and 50 inclusive, or a woman between the ages of 18 and 40 inclusive, unless he or she is exempted from the provisions of the Control of Engagement Order, or the vacancy is for employment exempted from the provisions of that order

ASSISTANT WORKS ENGINEER required for construction and maintenance of Chemical Works in West Riding, Yorkshire. Applicant should be 25-35 years of age. Should have sound theoretical training and practical experience in mechanical engineering and chemical works plant. Salary approx. £600 p.a. Pension Scheme. Applicants should state age, full details of training and experience to **Works Manager, Box No. 2840, THE CHEMICAL AGE, Fleet Street, London, E.C.4.**

MALE LABORATORY ASSISTANTS required by old-established firm of Chemical Manufacturers, with view to training as shift chemists. Commencing salary not less than £250 per annum, plus additional pay when working shifts. Full particulars to **Box No. 2842, THE CHEMICAL AGE, 154, FLEET STREET, LONDON, E.C.4.**

SITUATIONS VACANT

CHEMISTS. The Civil Service Commissioners invite applications for permanent appointments in the Ministry of Supply :—

A. In the Chemical Inspectorate (Atomic Energy)—PRINCIPAL SCIENTIFIC OFFICERS and **SENIOR SCIENTIFIC OFFICERS**—candidates should possess 1st or 2nd Class Honours Degree in Chemistry, or Physics, or equivalent, with suitable post-graduate experience in Emission Spectroscopy, Electronic Techniques or Physical Chemistry. For the higher posts considerable experience in the direction and organisation of work of more junior staff is required.

B. In the Atomic Energy Research Establishment, Harwell, Berks.—

(1) **PRINCIPAL SCIENTIFIC OFFICERS** or **SENIOR SCIENTIFIC OFFICERS**—candidates should possess 1st or 2nd Class Honours Degree in Chemistry, with experience in Fundamental Physical or Inorganic Chemistry research. Experience in Radiochemistry an advantage, and one post requires experience of Thermodynamics and Thermo-chemical Measurements.

(2) **SENIOR SCIENTIFIC OFFICER**—candidates should possess 1st or 2nd Class Honours Degree in Chemistry or Physics, and must have had research experience in X-ray Crystallography. Experience in study of Inorganic Chemical and Metallurgical problems by X-ray methods an advantage.

Applicants must have been born on or before 1st August, 1918.

Inclusive salary scales (provincial) :—

Principal Scientific Officer—
Men : £910-£1,177.
Women : £790-£1,016.

Senior Scientific Officer—
Men - £670-£860.
Women : £545-£760.

London scales are slightly higher.

Further particulars and application forms from **The Secretary, Civil Service Commission, Scientific Branch, 27, Grosvenor Square, London, W.1,** quoting No. 2794. Completed applications must be returned by 14th October, 1949.
4165/100.

THE CIVIL SERVICE COMMISSIONERS invite applications for permanent appointments as **ASSISTANT EXPERIMENTAL OFFICER,** to be filled by competitive interview during 1949. Interviews will be held shortly after the receipt of the completed application form, and successful candidates may expect early appointments.

The posts are in various Government Departments and cover a wide variety of Scientific (including Engineering) qualifications. Places of work are spread throughout Great Britain.

Candidates must be at least 17½ years and under 26 years of age on 1st August, 1949 ; time spent on a regular engagement in H.M. Forces may be deducted from actual age.

Candidates must have obtained the Higher School Certificate with Mathematics or a Science subject as a principal subject, or an equivalent qualification. Higher qualifications will be regarded as an advantage to candidates over the age of 20.

The inclusive London salary scale (men) is £230-£490. Salaries for women and for posts in the provinces are somewhat lower. Superannuation provision is made under the Superannuation Act.

Further particulars and forms of application from the **Secretary, Civil Service Commission, Scientific Branch, 27, Grosvenor Square, London, W.1, quoting No. 2522.**

Completed application forms should be returned as soon as possible.
2333/300.

SITUATIONS VACANT

Ministry of Supply invites applications from PHYSICAL OR INORGANIC CHEMISTS for appointments in the London Area

Candidates should have a good Honours Degree or equivalent, with post-graduate experience an advantage. Some posts require a good knowledge of Spectroscopy, Radiation Chemistry or Modern Physico-Chemical Methods of Analysis.

Salaries according to age and experience within the ranges :—

Senior Scientific Officer : £700-£900.

Scientific Officer : £400-£650.

Rates for women slightly lower.

Posts are Unestablished, but carry benefits under F.S.S.U.

Write, quoting **F.697/49 BZ, to Technical and Scientific Register (K), York House, Kingsway, London, W.C.2,** for application forms, which must be returned by 28th October, 1949.

12.9A43(30).

FOR SALE

GEORGE 600 COHEN'S

TWO DIRECT ELECTRICALLY UNDER-DRIVEN HYDRO EXTRACTORS by **Thos. Broadbent,** three-point suspension, pit type, with 72 in. diam. galvanised perforated basket. Hand-operated brake, non-interlocking wire mesh cover. Starter and motor suitable for 400/3/50 cycles.

ALUMINIUM HORIZONTAL CYLINDRICAL STORAGE TANK, 7 ft. 6 in. diam. by 36 ft. long overall. Fabricated from ⅜ in. aluminium sheet of 99.5 per cent purity. Welded construction, all welds dressed, giving smooth interior finish.

STEAM-DRIVEN HYDRO EXTRACTOR by **Thos. Broadbent,** three-point suspension type with 72 in. diam. galvanised perforated basket.

TWO HUMMER ELECTRIC VIBRATING SCREENS by **Mining & Industrial Equipment Ltd.,** type V.4000. Single-deck type, 8 ft. long by 4 ft. wide ; mesh at present fitted, ¼ in. by ¼ in.

ELEVATOR, part steel enclosed, of the continuous chain and bucket type, buckets approx. 10 in. by 7 in elevator centres 63 ft., together with a 5 h.p. 40/1 worm reduction gearbox, but excluding motor.

TWO IDENTICAL STEEL-ENCLOSED BUCKET ELEVATORS, each 29 ft. centres. Casing, 2 ft. 9 in. by 1 ft. 6 in. ; buckets, 10 in. by 6¾ in. by 4 in., set at approx. 2 ft. 6 in. centres. Buckets on single Renold chain.

SIZE 7 DUPLEX MIXING AND KNEADING MACHINE by **Morton of Wishaw.** Steam-jacketed trough approx. 42 in. by 38 in. by 30 in. Working capacity, 115 gals. Double Naben type twin gun-metal mixing blades. Internal w.p., 15 lb. per sq. in., or high vacuum. Power-operated tilting.

FIVE PEERLESS WHISKS OR MIXERS, 80 qt. capacity. Single high-speed type. Direct driven from 5 h.p. motor 400/3/50. New tinned pans, 20 in. diam. Various whisks, beaters, etc.

BAKER PERKINS DOUBLE TROUGH TILTING MIXER. Alloy trough, 20 in. by 14 in. by 17 in. deep. Aluminium interlocking hinged cover, gun-metal gate-type agitators driven through gearing. Pulley drive.

HORIZONTAL MIXER by **Krupp.** Approx. internal dimensions, 5 ft. by 5 ft. by 5 ft. Non-tilting double trough with heavy twin "Z" blades, bottom discharge along apex formed by troughs at present driven by 50 h.p. D.C. motor.

GEORGE COHEN SONS & CO. LTD.,
SUNBEAM ROAD, LONDON, N.W.10.
Tel. : Elgar 7222 and
STANNINGLEY, Nr. LEEDS.
Tel. – Pudsey 2241.

FOR SALE

TWO—ROTARY AIR COMPRESSORS by Hick Hargreaves, each 615 cu. ft./min. at 5 lb. p.s.i. 1450 r.p.m.

ONE—Ditto, 546 cu. ft./min. at 10 lb. p.s.i., 960 r.p.m.

TEN—Andco 6 in. worm-operated **PLUG COCKS.**

FOUR—Andco 2 in. worm-operated **PLUG COCKS.**

ONE—Andco 1¼ in. worm-operated **PLUG COCK.**

TEN—Andco 1 in. worm-operated **PLUG COCKS.**

FOURTEEN— ¾ in. worm-operated **PLUG COCKS**

ONE—Steel-cased **WORM CONVEYOR,** 8 ft. long.

ONE—Sectional Pressed Steel **STORAGE TANK,** 12 ft. by 12 ft. by 8 ft.

ONE—Insulated Mild Steel **COLUMN,** dish ends 3 ft. 11 in. diam. by 11 ft. 3 in. high.

ONE—Enclosed Cast-iron **BLENDING VESSEL,** 2 ft. 6 in. diam. by 4 ft. deep with agitator for 400 volts 3-phase, 50 cycles.

SIX—Enclosed Cast-iron **RECEIVERS,** 3 ft. diam. by 3 ft. 6 in. deep, fitted with brass basket coil and sight glasses.

ONE—All-brass **PRODUCT RECEIVER,** 2 ft. 11 in. diam. by 3 ft. 10 in. deep.

TWO—All-brass **PRODUCT RECEIVERS,** 2 ft. 11 in. diam. by 4 ft. 9 in. deep.

ONE—Lead-lined Welded M.S. **ETHYLENE COOLER,** 3 ft. diam. by 3 ft. 6 in. deep

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1—	8′ 0″	,, ×	19′ 0″ long
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3—	9′ 6″	,, ×	8′ 0″ deep
3—	10′ 0″	,, ×	13′ 0″ deep
1—	10′ 0″	,, ×	7′ 0″ deep
1—	7′ 0″	,, ×	6′ 0″ deep
1—	5′ 0″	,, ×	14′ 0″ long
5—	5′ 9″	,, ×	12′ 0″ long
9—	3′ 6″	,, ×	8′ 0″ long
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1—	24′ 0″	×	9′ 0	×	6′ 0″
1—	8′ 0″	×	6′ 0″	×	5/7′
1—	10′ 0″	×	5′ 0″	×	5′ 0″
1—	10′ 0″	×	4′ 0″	×	6′ 0″
1—	6′ 0″	×	4′ 0″	×	5′ 6″
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3—	30′	× 7′ 0″	,,
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1—	28′	× 7′ 0″	,,
2—	26′	× 7′ 0″	,,
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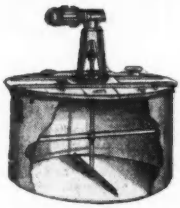

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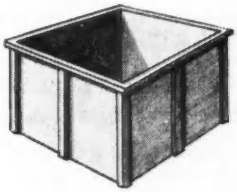

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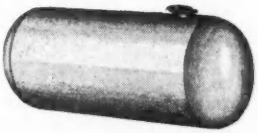

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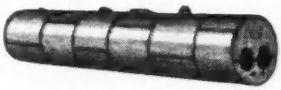

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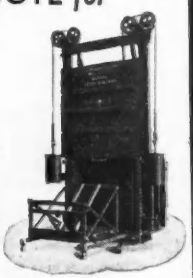
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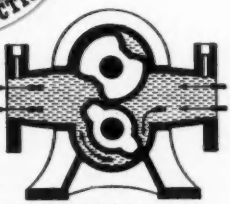

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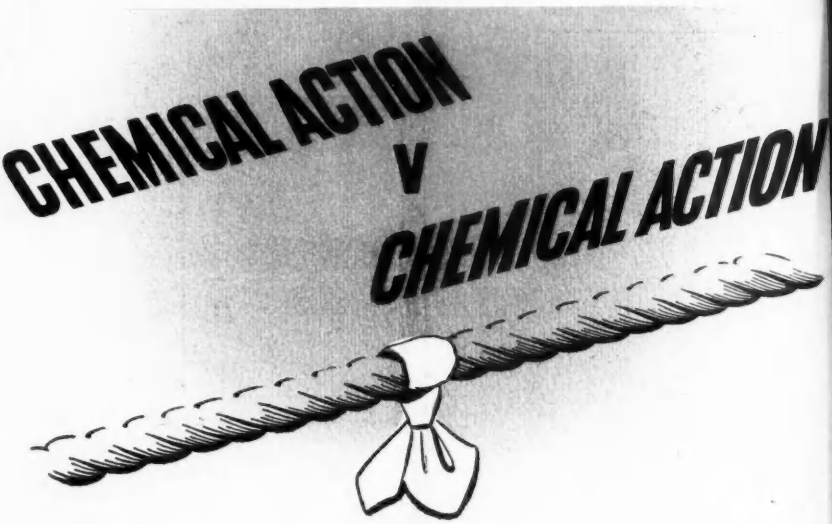

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